BULLETIN 231] **APRIL, 1915**

Ontario Department of Agriculture

Vegetable Growing.

S. C. JOHNSTON.

INTRODUCTION.

Vegetable growing brings one in close touch with Nature. Growing vegetables for pleasure or for profit has an uplifting effect on every one and benefit mentally and physically is received. Only those who study nature carefully can become successful gardeners. The backyard is the best place for the amateur to become familiar with growing vegetable crops.

The high cost of living has had the effect of calling the attention of residents in cities, towns, and villages to the hitherto neglected opportunities they have in their own nands of partially solving this troublesome question by growing vegetables in their own backyards. It is true that there are difficulties in many instances to be overcome before success can be obtained, but these are not insurmountable, as evidenced by many amateur gardeners, who have turned unpromising backyards into thriving vegetable gardens, and whose tables bear witness to the appetizing vegetables picked for the family's daily repasts. Those who, after a course of vegetables from the store, necessarily wilted owing to their having been picked for some hours, have tasted the homegrown product picked fresh for the meal will always remain enthusiastic advocates of the home garden.

Some people hesitate to have a garden on account of the small size of their lots. The amount of vegetables, however, which can be raised on a few feet of ground is astonishing, but, of course, intensive gardening is necessary in order to reap the best results.

Vegetable growing, as practised by either the professional or the amateur gardener, is the most intensive form of agriculture. The bringing of a crop of vegetables to a successful yield involves more detail than the growing of any general farm crop. More progress nas been made in the scientific handling of this crop than any other known crop in agricultural lines. Vegetable soils are of the highest fertility of any soil anywhere, and more actual returns can be secured from an area devoted to vegetables than from any other crop grown on the same area. Market gardens or gardens of a limited size located close to our large industrial centres produce as many as three and four crops per season, each crop being grown to maturity and helping to add to the financial income of the gardener. The successful maturing of several crops per season from the same soil is the highest form of intensive gardening. Vegetables are grown on large acreages in the province in localities suitable for successful growing and marketing of the crop. For instance, the district in the Pelee marsh near Leamington, in Essex County, during the season of 1914, shipped over 300 carloads of onions to distant parts of

Canada. The district near Sarnia shipped over 200 carloads of potatoes, carrots, beets, cabbage, etc. The Leamington district also shipped out many carloads of early tomatoes to the Canadian West, some being sent to Calgary, Alberta. Melons are also an important crop sent from this district. From Hensall, Ontario, onion sets are marketed from coast to coast, over sixty acres being annually planted to this crop. In the Niagara district hundreds of acres of tomatoes are grown for canning-factory purposes. Over 70 acres of celery are grown near Thedford, Ontario. Prince Edward County is the garden of Eastern Ontario, practically 75 per cent. of the farmers in the county growing a certain amount of produce for the canning factories, such as tomatoes, corn and peas.

The vicinities bordering on our larger cities in the Province are largely made up of market gardens. Numerically there are nearly 1,000 individual gardens in the environs of Toronto, and cities such as London, Ottawa, Kingston, and Hamilton have vegetable growers at the same rate. These market gardeners handle on an average from six to eight acres, some more and some less. There are vegetable gardens in the Province of Ontario which annually produce only vegetable crops on over 100 acres.

To encourage an increased production of vegetables of superior quality, the Ontario Department of Agriculture has had this bulletin prepared in such a way that information for the amateur and the professional is easily available.

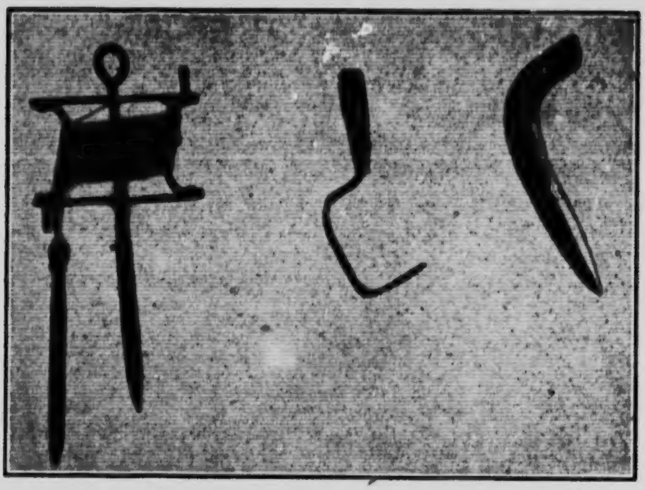
THE BACKYARD GARDEN.

Considerable interest has been aroused in different cities of the Province by the Horticultural Societies offering prizes for the best backyard garden. A considerable number of people in the cities make a practice of utilizing at least some part of the land adjoining their homes for the growing of flowers and vegetables.

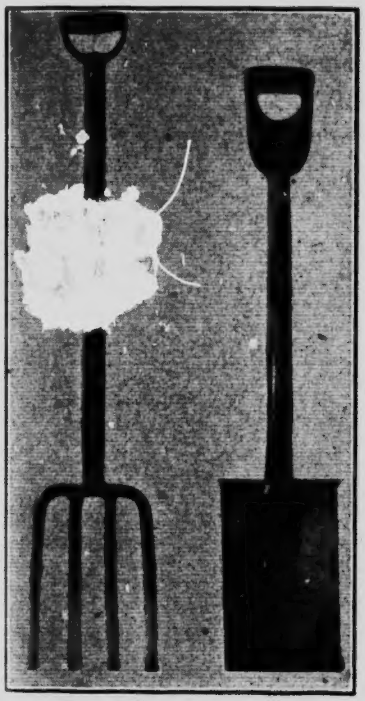
It is known that many who follow this practice grow considerable amounts from a very small piece of land. In some cases where sufficient land is available a supply of vegetables has been obtained for the summer months and quite a few were grown for winter storing. Where the householder is inclined toward gardening, and when he has sufficient time, many vegetables can be easily grown. It must not be understood that these crops can be grown without considerable time and careful attention to carry them through the season.

Preparation of Soil.—All city back lots, irrespective of soil, should receive applications of manure annually. Too much manure cannot be given. This should be applied in the fall or winter months. In the spring the soil should be carefully dug over to a depth of six to eight inches. This can be best accomplished with a digging fork. This will give the soil a thorough mixing, and will help to break up the lumps of soil. Digging should commence as early in the spring as possible. This should be followed by raking the surface to remove all sticks, stones and other rubbish. The ground should be made as level as possible, not raking it up into beds or mounds as many do. Paths should now be marked out and the garden plan made in order to know just where certain vegetables should be planted. Following a thorough raking and levelling, planting should commence.

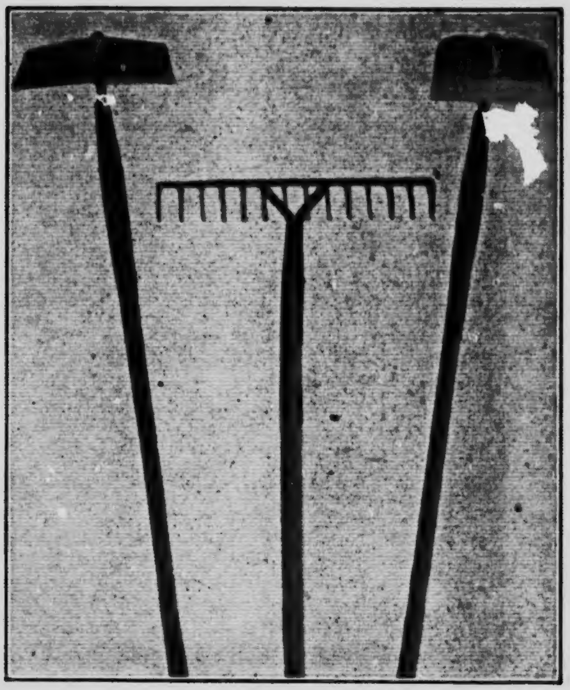
Soil.—Not all city lot soils will produce vegetables of first-class quality the first season, no matter how much attention is given. In some districts heavy blue clay has been excavated to make the cellar and has been dumped on the backyard. This would require considerable attention and fitting up to make into a garden



A garden line to help make straight rows, a hand weeder for working among tender, young plants, and a dibber for making the holes for transplanting cabbage, cauliflowers, etc.

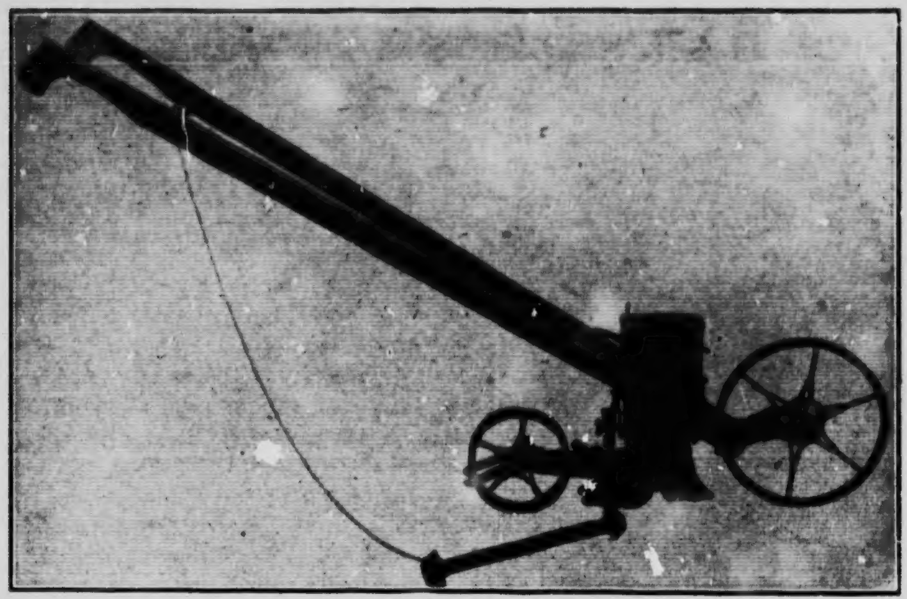


The digging fork and the spade are the best implements for bringing the soil into a fine condition.



The garden rake should be used to make the surface of the garden level, and to remove all rubbish. Hand hoes may be procured in various shapes and sizes. The hoe should be used incessantly during early growth.

soil. There are many soils in city backyards that would require several years' cultivation to properly fit them for vegetable growing. Large quantities of manure would have to be applied and worked in. However, there are many backyards which could grow sufficient vegetables for the home without any serious trouble.



Seed Drill. A first-class seed drill which can be regulated easily is a necessity on all gardens. Note marker for making succeeding rows straight.

Seed Drill—Care should be taken that the rows are drilled in straight. Nothing looks worse on a vegetable garden than unnecessarily crooked rows.

It is more the lack of time which can be spent on the garden than anything else which permits the backyards to be grown up with weeds or grown entirely in a grass plot. City vegetable enthusiasts will do well to read carefully the directions given for the various crops, etc.

Planting.—In the backyard garden of ordinary size vegetable seeds can easily be sown by hand. It is a good general rule in planting seeds of this nature to cover them with soil equal to two or three times the thickness of the seed. In some cases this will not be correct, but in the most cases this depth will be best. Furrows can be made with the corner of an ordinary hand hoe or with a lath. Seeds should be planted from a tin dish such as a pie tin. Seeding may be carried on at any time of the day. The soil should be warm, and when a handful is gathered up it should be loose and not sticky. The seeds should be covered with fine soil, and this can be best done by drawing the soil over the seed with a lath. It is a good plan to "tamp" the soil with a flat piece of board or with the broad side of a hoe. A gentle patting or tamping of the soil over the seed will induce germination. As a rule all vegetables of one kind should be planted together. Carrots, beets, parsnips, etc., should be placed by themselves and not mixed in with cabbage and cauliflowers, etc., excepting in cases given under successional and intercropping.

All vegetables require plenty of sunshine. The fences may be used to advantage in growing cucumbers, muskmelons or tomatoes. These must, of course, in this case be supported on strings, stakes or trellis. Mint and other herbs may be grown in partial shade.

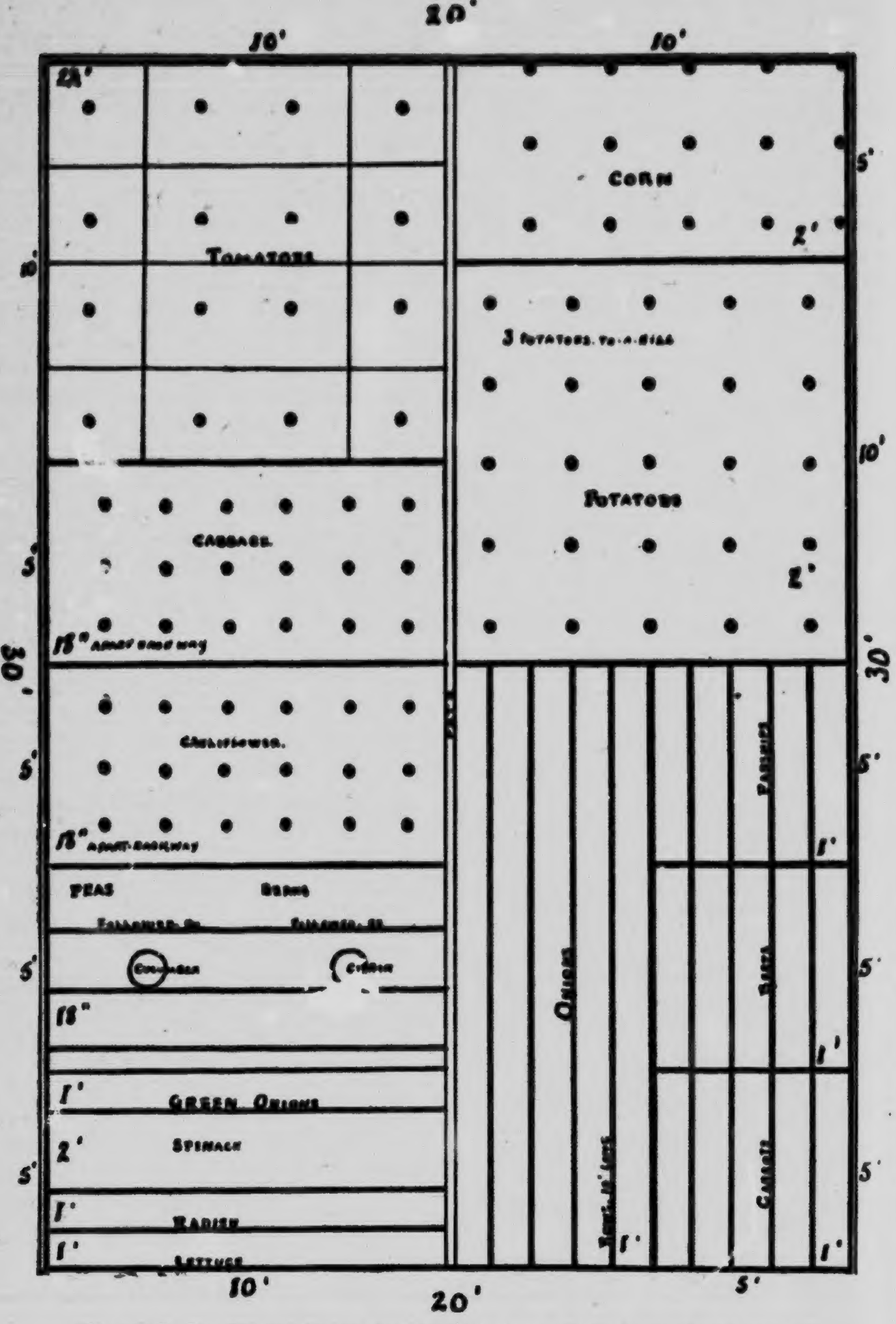
A planting calendar will be found elsewhere.

Securing Good Plants.—One of the reasons why city people have poor results with their transplanted vegetables is because they do not secure strong healthy plants at the start. If it is impossible to grow one's own plants, the next best thing is to get in touch with someone who does. Market gardeners often grow more plants than [illegible] require, and are willing to sell them. These are always strong healthy plants, which will fruit early and give good yields. It is not advisable in any case to purchase weak spindly plants. Tomatoes, cabbages, cauliflower and celery can be secured in this way.

Cultivation.—Cultivation must be carried on for two reasons. First: to keep down the weeds, which will grow faster than the vegetables and will smother them out if allowed to stay, and, secondly, to keep a fine mulch on the surface of the soil, which is necessary to conserve moisture. Cultivation in a small garden can be done by a hand hoe or a wheel hoe and should commence just as soon after the weeds show through the ground as possible. An ounce of prevention is worth many pounds of cure in this particular instance, and all possible weeds should be hoed out when in young stages. Some crops need expert hand weeding. This can be done with a hand weeder which will work in between the crops better than many hoes. Cultivation should not cease until the growth of the crop prohibits. Cultivation does not need to be deep. A mere skimming of the surface will often give better results than laborious deep hoeing.

Watering.—In cities and towns a water supply is readily available and this is considerable help to many crops. Watering should be done in a fine spray, and it is a good plan to cultivate shortly after watering. Such crops as lettuce, spinach, celery and cabbage respond readily to applications of water.

Winter Use.—Some of the vegetables grown can be stored in cellars, etc., and kept until well into the winter. Another section deals with this.



Proposed plan for portion of backyard to be used as a household garden.

Directions.—The forgoing plan is of a portion of a city backyard 30 feet by 20 feet, showing how it might be planted with vegetables for home consumption. Other crops may be substituted if required, these being suggested as those which will help in keeping down the cost of living somewhat during both summer and winter months. The following short directions should be carefully considered in addition to the treatises on each crop:—

Tomatoes.—Secure strong, healthy plants. Do not accept any whose stem is not as thick as a lead pencil. Water the soil thoroughly around the roots. Make a hole 3 to 4 inches deep with a hoe. Set plant upright and draw soil in around plants. Do not plant closer than 3 feet. Closer planting will cause small fruits and smaller quantity. Cultivate with hand hoe to keep down weeds. Use both ripe and green fruits. Before danger of frost pull up vines and hang up in dark cellar. Fruits when taken to cellar nearly green will ripen up to Christmas.

Corn.—Make holes in the soil two inches deep with ordinary hand hoe. Drop in four or five seeds, draw in the soil and tramp down with the foot. Cultivate to keep down the weeds.

Cabbage.—Secure strong plants. Water soil around roots thoroughly. Make hole three inches deep with dibber or the end of a hoe handle. Firm the soil around the roots thoroughly. Cultivate to keep down weeds. Cut when ready for use. In fall pull them up and turn upside down. When it freezes up take to cellar.

Cauliflower.—Plant and cultivate as above. When heads are 1½ inches in diameter tie leaves in at top with string.

Onions.—Sow seed in shallow furrow made with the corner of a hoe. Cover seeds with about ½ inch of soil. Place eight seeds to one inch. Keep down weeds by hand weeding and hoeing. In September pull onions and lay on top of ground to dry. Cut tops off and store before frost.

Potatoes.—Make holes four inches deep with hand hoe. Cut potato, leaving two eyes to a set. Plant three or four sets in a hole and cover with soil. Keep down weeds with hand hoe and as season advances draw soil up around the plants.

Beets-Carrots-Parsnips.—Sow seed in shallow furrows made with corner of hand hoe. Keep out all weeds. Thin plants as directed in planting table. For winter keeping follow directions given under individual crops.

Lettuce-Radish-Spinach.—Have soil in a fine condition. Scatter seed broadcast or in rows 3 to 4 inches apart. Barely cover by going over soil with garden rake. Pull or cut when fit to use. As soon as part of one crop is off, the land should again be planted.

Green Onions.—Secure Dutch sets from seed store or seed house. Plant these in rows six inches apart as close together as they can be placed. Pull when large enough to eat.

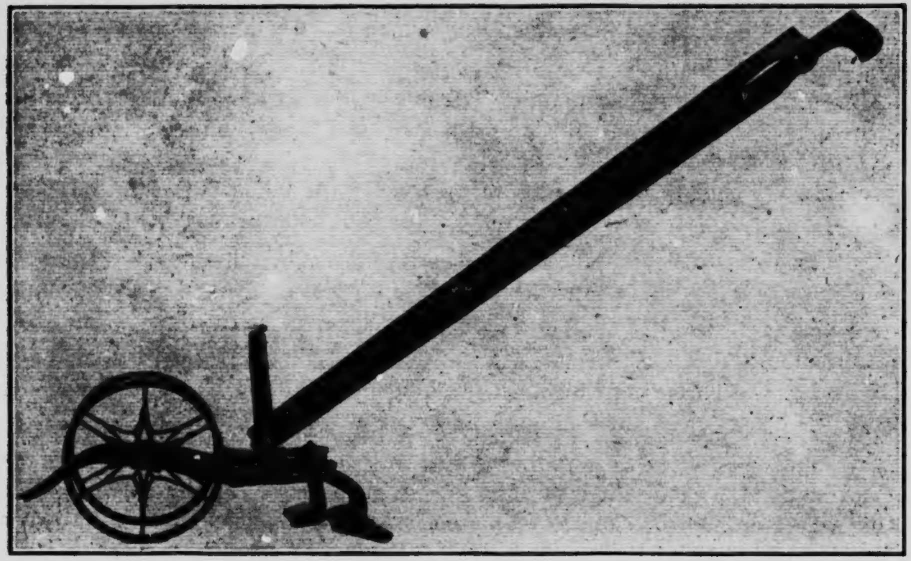
Beans and Peas.—Plant beans and peas in shallow furrow two seeds in a place. In the centre of bed leave open part of soil one foot square. These squares should be planted with cucumbers or citrons. Six or seven seeds should be planted and but three strongest plants left to mature. The pea and bean vines should be removed early enough to allow cucumber and citrons to mature.

Time to plant as recommended for Toronto District.

Tomatoes	June 5th.	**Onions**	April 15th.
Corn	May 15th.	**Lettuce**	April 10th.
Cabbage	April 20th.	**Radish**	April 10th.
Cauliflower	May 1st.	**Spinach**	April 1st.
Potatoes	April 20th.	**Green Onions**	April 1st.
Parsnips	April 15tn.	**Citrons**	June 5th.
Beets	April 15th.	**Cucumbers**	June 5th.
Carrots	April 15th.		

THE FARMER'S VEGETABLE GARDEN.

Unfortunately the average Ontario farmer pays but little attention to the growing of vegetables for his own use. Usually the excuse given is that he has not the time, and the next best reason is that he does not bother about them. This should not be, for the farmer has the land and the manure and the tools, and he should grow a supply of vegetables for his own use, both for summer as well as fall and winter use. Very few farmers have asparagus, more because it is considered a luxury for the rich. A small patch of asparagus should be found beside every farmhouse in the Province. Once it is established it requires very little attention and the crop is one of the first in the spring. A small plot of ground close to the house could be easily handled and such crops as spinach, lettuce, radish, early beets, carrots and cabbage grown quite easily. Probably the root field will be the best place to grow the root vegetables for winter use. Beets, carrots, parsnips, turnips, onions, cabbage, squash, pumpkins and corn can be sown in the field and handled at the same time as the field crop of mangels or turnips. No other crop on the farm will give as much satisfaction to the grower himself as the vegetables. Sufficient vegetables can be grown to supply a good change of food during the winter months if properly stored.



Wheel Hoe—used for cultivating crops grown too close for horse cultivators. Will be found very handy in back yard gardens. Several sets of teeth may be used on this machine.

IMPLEMENTS.

Vegetable growing being such an intensive form of agriculture and there being such a number of crops which demand careful attention it is quite apparent that numerous tools and appliances are necessary to satisfactorily grow a good crop.

For the backyard garden a spade, a digging fork and a hoe are absolutely essential. It is more convenient to have a garden line, several hoes of various shapes and a hand weeder. For the market garden a first-class seed drill, a wheel hoe with several attachments, numerous hoes, rakes, spades, digging forks, etc., are essential, besides the various horse cultivators which are necessary in the larger crops. Dibbers for transplanting come in various sizes and shapes. A very useful one may be made from a broken spade handle. This should be about fifteen inches in length and sharpened to a point. There are combined weeders and mulchers on the market which have proven labor savers for the vegetable grower.

Horse drawn implements, such as scufflers, should be of the best and such that several operations may be handled with the one machine by adjustment or addition of parts. Plant boxes or flats, as they are most generally called, should be 12 x 18 inches in size for convenient use, and should not be deeper than three inches. Finnan haddie boxes may be used for this purpose. Small frames to hold one pane of glass are also to be found on many vegetable gardens. These are used to hasten growth of plants and protect them from frost. Hot beds and cold frames are also essential parts of a vegetable grower's equipment and are described in another section. Mats are sometimes used to cover the sash of a hot bed on a cold night. Spraying apparatus is necessary for the successful growing of some crops. A knapsack sprayer should be made of brass, as the galvanized iron will not stand the corrosion from the materials used.

Flat or plant box used for starting young plants in greenhouse or hot bed. Finnan haddie boxes are commonly used.

Compressed air machines, which develop the power from the wheel, are also used on large gardens. On a small garden a barrel pump set on a platform constructed on two cultivator wheels will do excellent work.

GOOD SEED.

Probably there is no more important end of the vegetable business than that of the seed. A grower may have soil of the finest quality, have all the tools necessary, have plenty of labor and yet his efforts will be a failure if his seed is not up to the mark. Too much has been said of later years on the point of cheaper seed. and too little on seed possessing a better germination value and a better quality altogether. True, some seeds would be appreciated more if they were somewhat lower in price, but practically 95 per cent. of Ontario vegetable growers would rather pay more for their seed and feel confident that the crop would be a success as far as the seed end was concerned. One celery grower in Ontario this past season would have been money in pocket had he paid $100 per ounce for good seed All vegetable growers should buy the very best seed possible, no matter how much it costs, in order to prevent serious losses. Further, it is not advisable to limit the purchasing of seed to one seedsman. Better to have samples from two or three and compare results. This will also help to overcome losses through impure seed. A grower should buy his seed from men who are absolutely reliable and well known

However, if a grower will not follow these practices the least he can do is to grow one season a small quantity of the seed he intends using during the next If it is of good or poor quality he will find out without losing too much. Many of the more progressive growers in Ontario make a practice of this in such important crops as celery, onions and cauliflower.

"Quality" in the seed should be considered above all things.

POTS.

Success in growing early vegetables depends on the quality of the plant which is set out in the field. It should be strong and vigorous and should be grown throughout all its young stages without any check. Owing to the rapid growth of the plants they soon become too large for the flats in which they have been planted. It is a general rule to transplant them into pots of some kind. Clay pots of various sizes have been used for this purpose for a number of years, and on many gardens they are just as much a part of the equipment as any of the tools. During later years paper pots have come into a more general use. These are made from a stiff paper, usually a heavy manilla paper, which can be procured at any wholesale grocers. Two, four and six-inch paper pots are most generally used. The vegetable grower can have them made for him at a very reasonable cost by any printer. or he can cut them himself, or he can purchase them already cut for about $1.75 per 1,000. It is usually considered that the latter method is the most satisfactory one.

Many growers prefer to use these paper pots or dirt bands, as they are sometimes called, in preference to clay pots. They are set in flats filled with earth and the plants transplanted into them. They cannot be moved separately as well as the clay pots, but a number can be handled in one flat. They are very cheap and the plants do just as well in them as in clay pots, and when transplanting in the open comes, pot and all can be planted. They are specially good for tomato plants and stand up well under watering. Quart berry boxes are often used for tomatoes and give equal success. The cost of these is considerable, and yet many growers prefer them to either clay or paper pots, because of the ease of handling individual plants.

CO-OPERATIVE ASSOCIATIONS.

Vegetable growers have been co-operating with one another in several sections of the Province for purposes of buying and selling. The most notable example of the good effect that co-operation has shown is to be found in the Sarnia district.

Two co-operative associations there have increased the output of that district from a minimum some five or six years ago to over 400 carloads of vegetables in 1914, valued at over $100,000. They ship their products to many parts of the Province as well as to distant points in the Dominion. Their goods are becoming known on the market and a ready sale is found for Sarnia vegetables. What can be done in Sarnia district can be done in many other sections of the Province, and districts so located as to have excellent shipping facilities can become important vegetable centres. Through the operations of these co-operative associations the quality of the product is rapidly becoming better.

Carload lots demand uniform quality, and this demands a standardisation of variety and a uniformity of the goods shipped out from one district.

LIMING OF SOIL.

By the continued applications of immense quantities of manure every year it is often found that vegetable garden soils have become acid. This is particularly so in muck soils. Plants cannot grow to their best advantage in acid soils. Lime is a corrector of such conditions. Practically all garden soils in Ontario would benefit by applications of from 500 to 1,000 lbs. of lime per acre. Any form of lime is used, and it is best to apply it in the fall, although spring applications are valuable also. Rock lime can be piled in heaps and covered with soil and allowed to slake. The slaked lime should then be spread. Agricultural lime or ground limestone can be broadcasted by means of a bright shovel. Liming should be given garden soils at least once in five years.

HOTBEDS.

Although during later years greenhouses have become more generally used hotbeds are still extensively employed wherever it is necessary to start early plants. A hotbed is simply an inexpensive forcer which can be erected by anyone. Many farmers annually lay down a hotbed, quite a number of city gardeners use them and every vegetable grower depends on them for probably 50 per cent. of his outdoor crop.

Seed can be sown in the hotbed before the snow is off the ground, and the plants will have from four to six weeks' start when warm weather comes in the spring. By this means the vegetable grower has that much start on the crop grown from seed. This means early marketing, which every grower is seeking for because of the increase in returns.

Some crops can be grown to maturity in our climate only by the use of the hotbed.

Location.—Hotbeds should be placed in a warm position close to the house or greenhouse. First and foremost they must be handy, for considerable attention is required to handle a hotbed successfully.

They should be set facing the south if possible, and should be sheltered from severe winds by buildings or windbreaks, either natural or artificial. On vegetable gardens where perhaps 100 beds are made, the rows should be parallel and should be such a distance apart that the plants can be conveniently handled. Some growers have them three feet apart and others ten feet. They should be located close to a ready supply of water, for large quantities are required at all seasons.

Watering.—Water sparingly in the early part of the season, and only on bright days. It is advisable to water with a can which throws a fine spray, only when the plants really require it, and then in the morning. This time is recommended because the plants will have time to dry off before evening, and thus avoid diseases, which come through leaving a moist atmosphere in the bed over night. Some growers who do not use many hotbeds recommend slightly warm water. On a large scale this is not followed ordinary cold water only being used.

Ventilation.—Probably this end of the management of a hotbed is the one requiring the most care and attention. The hotbeds are ventilated by supporting one end of the sash on a small block of wood or by raising the whole side of a sash and blocking it up or by supporting it on the side of the next sash to it. The side or end facing the wind should never be opened. As the season advances the sash are sometimes drawn partly off the frame, and as the warm weather comes the sash is taken off entirely during the day.

Continuous hotbed, as used by a vegetable grower. The soil beneath is free from frost and for this reason 18 inches to 2 feet of manure are not required. This bed can be added to.

Time to Ventilate.—Hotbeds should be ventilated every day, some days more than others. On a stormy day it would be out of the question to ventilate very much, but a lath under the sash will give a good circulation of air. On a bright, sunshiny day the sash can be raised up as much as two inches. They should be opened in the morning when the air becomes somewhat warm, and can be left until the afternoon when it begins to get cool again. It should be seen to that the sashes are replaced before night. The question of how long the sashes should be left open must be determined by experience. A thorough circulation of air is essential, but too much cold air will give the plants a check and in all probability ruin the crop. Always ventilate after watering to prevent scalding the tender plants.

Planting in a Hotbed.—After the soil has been thoroughly prepared by raking down and all straws and other refuse removed the seeds should be planted. Rows three inches apart and having a depth of one-quarter inch are made by gently pressing a lath into the soil. The seeds can be sown by hand and then barely covered with soil by simply drawing the soil back again with the lath.

Care of Plants.—It will be necessary to pull out all weeds as soon as they are seen and they will appear before the vegetable plants. As the plants grow they should be watered occasionally and given plenty of ventilation. Later on, if they commence to crowd in the row, they can be thinned out as necessary. Stirring the soil several times during the growth with the fingers or a hand weeder will be found a good practice.

What Plants to Grow.—A hotbed will give a good supply of lettuce, radish, beets and carrots before they can be had from seed sown outdoors. Lettuce and radish can be grown in the same row. Green onions can be secured by planting small onions close together in the row. Young tomato, cabbage, celery, onion, cauliflower and many other plants can be started in the hotbed. These will be far in advance of those grown from seed out of doors as far as earliness is concerned.

Cold frames—These are used to harden plants before transplanting out of doors. These are covered with sash during cold weather, and later with frames covered with canvas or cheese cloth.

The spent hotbed may be used to grow muskmelons. A few seeds may be planted at each end of the bed in the soil, and by keeping the sash on during the night until warm weather comes a good crop of melons of excellent flavor can be secured.

COLD FRAMES.

A cold frame is merely a part of the garden covered with a sash supported on a wooden frame. A cold frame has no bottom heat or any other heat excepting that received from the sun; and otherwise it is the same as a hotbed. The cold frame is used to protect tender growing plants from cold weather. It prevents strong winds from disturbing the plants and protects the plants from severe changes in the weather. It is used more as a middle or hardening stage for the plant before it is taken to the field. It hardens off the plants so that they can stand any ordinary change in the weather which may come after transplanting time. Cold frames are also used along in the season to start young plants, particularly cabbage and cauliflower plants.

Cold frames are usually placed near the greenhouse or in a sheltered position. In some cases the frames are made in the field where the plants are to remain and the frame is removed as the season advances, leaving the plant in its permanent position. They can be protected in severe weather by means of banking up the sides of the frame with earth or manure. Straw or mats may be spread over the sash on cold nights. As the warm weather comes the sash may be replaced by frames covered with cotton. These should be the same size as the sash and should be used as a covering for the plants on cool nights. The cotton will permit a free circulation of air and yet will not allow the temperature to go down too low to damage the plants.

MANAGEMENT.—The soil in the cold frame should be a good garden soil fairly light. Many growers transfer the flats with the plants in them from the hotbed to the cold frame, thus doing away with securing soil for the cold frame. Watering should be given frequently to keep the plants growing. Ventilation must be looked after carefully.

SUCCESSIONAL PLANTINGS.

In order to have a fresh supply of vegetables on hand during the early summer months seed may be sown at intervals of a week or ten days until June 1st. This will greatly improve the quality and give a more general run of popular crops. The following crops may be handled in this way: Corn, radish, lettuce, spinach, endive, beets.

When successional plantings are made only a short row should be used for those requiring only a small supply. For the vegetable grower longer rows will be necessary, but care should be taken not to over plant.

Several growers of lettuce on quite a large scale plant a certain amount each week, and in this way are assured of a fresh crop every week or ten days throughout the season. By doing this they do not overload the market at any time and their customers have fresh, well-grown lettuce in constant supply.

Successional plantings are not limited to one crop. One crop may be grown to maturity and harvested, and the ground immediately planted with another crop of entirely different nature. This again may be followed with still another crop in many sections under careful management. Successional cropping is practised by many of the more progressive vegetable growers, and while there is considerable labor attached to this method of vegetable growing the returns per acre are oftentimes doubled and tripled on small acreages.

Some examples of successional plantings are as follows:

Spinach, followed by celery.
Early potatoes, followed by late celery.
Lettuce, followed by turnips.
Lettuce, followed by cabbage.
Lettuce, followed by parsnips.
Cabbage, followed by celery.
Peas or beans, followed by winter radish.

INTER CROPPING OR COMPANION CROPPING.

Where two or more crops are grown on the same soil at the same time it is known as intercropping or companion cropping. By this is meant that crops maturing at different times are planted together and when one is ready for market it is cut and the other one left until it reaches maturity. Intercropping is practiced on small pieces of land with good success. Larger returns can be had from this method than any other. The land must be practically full of manure in order to grow the crop quickly and not allow them to become starved in any way. Intercropping practically prohibits horse cultivation and for this reason many vegetable growers do not follow this practice to any extent.

The following examples explain:

(1) Cabbage in rows three feet apart.
Two rows of Spinach 8 to 10 inches apart in between.
(2) Early lettuce and beets 10 to 12 inches apart.
(3) Horseradish in permanent rows three feet apart.
Cucumbers in alternate rows 6 to 8 feet apart.
(4) Corn and pumpkins both permanent crops.
(5) Parsnips in rows three feet apart.
Early beets pricked out in between rows.

STERILIZATION OF SOIL.

Many of the fungus diseases which are commonly found attacking various vegetables are carried over the winter in the soil. Some treatment of the soil is necessary to prevent them damaging or ruining the young plants in the seed bed. There are several methods of handling the soil which have given results in the prevention of disease. Some of these methods are practically absolutely certain, while others are not so reliable; yet any methods which will help in some way to prevent some of the diseases which hinder the vegetable grower from harvesting a full crop are worth considering. The methods are as follows: Sterilizing with boiling water, with formalin and sterilizing with steam.

Boiling Water.—The most common method of sterilizing soil and the one which many gardeners practise is to thoroughly saturate the soil with boiling water. The soil can be placed in the hotbed in a box or in a pail and a quantity of boiling water poured over it. Most growers follow this method in treating the soil in which they grow cabbage and cauliflower plants: some do it for lettuce, celery and other young plants used for transplanting. The soil can be used the day following if this method is followed.

Formalin.—To secure more reliable results some vegetable growers sterilize their soils in the same manner as with the boiling water, excepting that they use one pint of formalin to thirty gallons of water, and use cold water. Thorough saturation of the soil makes this method efficient. One gallon of solution should be used for each square foot of soil. It is good practice to cover the soil with some burlap or old bags after this application. The soil cannot be used for at least a week with this method unless the season is well advanced.

Steam.—There are several methods of sterilizing soil with steam and they are probably the most reliable ways of treating the soil. This method is used more by greenhouse growers and yet a considerable number of growers using hotbeds and cold frames employ this system every year. While it is somewhat expensive for one who has no greenhouse heated with steam those who have this advantage can handle their soil very easily. Some build a concrete pit close to the hotbed yard and have several one-inch pipes on the sides and from one side to another. These have small holes drilled in them six to eight inches apart on the under side of the pipe. The earth to be steamed is dumped into this pit and the steam turned on. Usually some sort of a covering is constructed to cover this pit. Live steam at from ten to twenty pounds pressure should be allowed to thoroughly heat the soil for an hour. The soil is then placed in the hotbeds or cold frames and used as soon as it has cooled sufficiently. Twenty-four hours will usually cool the soil if left in the open.

Another method used for treating the soil is to use an inverted galvanized pan. This can be set over the soil in the greenhouse, cold frame or in the open ground. For the frames a pan six feet by three feet can be used. This pan is driven down into the soil which has been dug over and when well down into the soil can be weighted. The steam can then be turned on. If the steam can be used at a pressure of twenty pounds, twenty minutes to half an hour will be sufficient time to obtain excellent results.

While many growers do not follow any of these methods of treating the soil, previous to planting the seed, those who do make it one of their spring operations and claim the cost of the operation is more than returned by the results. The claim for sterilized soil is that the seed will germinate sooner, the plants will grow stronger and more vigorously, and many of the diseases so common in young plants are overcome.

IRRIGATION.

To be in a position to command a sufficient supply of oil moisture at any time during the season for growing vegetables out of doors would make the vegetable grower practically independent of rainfall. Such a condition is most nearly secured by some form of watering by artificial methods. Water is necessary in the soil at all times during the growing season and many a gardener has had the misfortune to have his crop ruined by severe dry spells during July and August. Such crops as lettuce, celery, spinach suffer such a check during a dry spell that they never recover in many cases.

There are several methods of watering these crops artificially and they have proven themselves a boon to vegetable growers who have installed them. The most popular method is known as the Skinner System of Irrigation. There are several other systems patterned after this one and are practically the same. This method in a few words, is applying water by means of elevated pipes placed at regular distances in the field, through which the water is forced. A nozzle set in the pipe helps to throw the water in a fine mist.

This form of irrigation has proven itself valuable to the vegetable grower in Ontario. Particularly in the vicinity of London, Ontario, several growers depend largely on irrigation for their early crops of fresh, crisp, well-grown vegetables.

Water Supply.—It is imperative that a large supply of water is available before irrigation by any method should be attempted. A running stream or a pond of water is best, for they insure an unlimited supply. When these are not available a driven well can be used. In some cases water has been pumped one-half a mile to the garden to supply the necessary irrigation. As the water must be driven through the pipes at considerable pressure the water is usually pumped direct into the system by means of a gasoline engine or by the use of electric power where available. If so desired the water can be pumped into a reservoir and then carried from this into the system. Only in rare cases is it advisable to pump the water into an elevated tank depending on the elevation of the water for the pressure. It is much better to pump direct into the system.

Arrangement of Pipe.—Pipes of galvanized iron are supported on posts of various heights from three feet to eight feet in parallel rows over the field, fifty feet apart. Every three to four feet on the pipe is a patented brass nozzle which breaks the water into a fine spray. On the feeding end of the line is a patent turning device which permits the turning of the whole line of pipe at any angle desired. This allows for watering a space twenty-five feet wide on either side of the pipe line. In this turning device there is also a metal strainer which prevents any refuse becoming lodged in the nozzles.

Overhead Irrigation—Very popular among up-to-date vegetable growers. Many crops can be grown to a better advantage by the use of this system.

Advantages of Watering.—By irrigation the vegetable growers become free of drought conditions. The plants never receive a check and are grown to the best advantage. Watering can be carried on at any time of day or night, although Ontario growers prefer to water in late afternoon. The system can be started and only frequent turnings of the line are necessary. Plants can be matured more quickly by watering. Early outdoor crops can be ready for market a week or ten days earlier than those without water. This increases the return from the acreage planted because of higher prices for early crops. This form of irrigation has been used also for frost prevention. In the case of a crop of late tomatoes the crop was saved from ruin by an early fall frost by continually running the water over the vines and fruit throughout the night.

Cost.—This system can be installed [illegible] grower. The ordinary galvanized pipe can be cut and erected according to [illegible] rules to overcome friction, etc. Holes for the brass nozzles can be drilled by hand with a small drill made for this purpose and the whole system placed on supports for an average cost of $120 per acre, exclusive of engine and pump. This may seem rather a high cost, but many growers claim to have paid for their system in two dry seasons by being able to sell first-class crops when the market was strong.

General Advice.—Any vegetable grower installing this irrigation system should purchase an engine and pump adequate to handle a considerable acreage at the outset. Even though only one acre is covered with pipe a large engine and pump should be used. Many growers have had to throw away a small outfit with very little use when they increased their pipe lines.

Some growers prefer their pipe lines on short stakes three feet high and others advocate a cedar post or an inch and a quarter pipe eight feet high. The latter seems to be the more popular, because it allows for convenient cultivation close to the posts. High poles with cables for supporting the pipes are rarely used, because of the cost of erection and the danger of wind pressure swaying the pipe sufficient to break connection, etc.

NUMBER OF PLANTS REQUIRED PER ACRE AT VARIOUS DISTANCES.

1 inch	x	10 inches	627,279	18 inches	x	2 feet	14,520
1 "	x	12 "	522,720	18 "	x	30 inches	11,616
2 inches	x	10 "	313,632	18 "	x	3 feet	9,680
2 "	x	12 "	261,360	18 "	x	4 "	7,260
3 "	x	12 "	174,240	18 "	x	5 "	5,804
4 "	x	12 "	130,680	2 feet	x	2 "	10,890
6 "	x	12 "	87,120	2 "	x	3 "	7,260
12 "	x	12 "	43,560	2 "	x	4 "	5,445
12 "	x	15 "	34,848	2 "	x	5 "	4,356
12 "	x	18 "	29,040	3 "	x	3 "	4,840
12 "	x	25 "	21,780	3 "	x	4 "	3,630
12 "	x	30 "	17,424	3 "	x	5 "	2,904
12 "	x	3 feet	14,520	4 "	x	4 "	2,722
12 "	x	4 "	10,890	4 "	x	5 "	2,478
12 "	x	5 "	8,712	5 "	x	5 "	1,742
15 "	x	18 inches	23,232	5 "	x	6 "	1,452
15 "	x	2 feet	17,424	6 "	x	6 "	1,210
15 "	x	3 "	11,619	6 "	x	7 "	1,037
15 "	x	4 "	8,712	6 "	x	8 "	907
15 "	x	5 "	6,969	7 "	x	7 "	888
18 "	x	20 inches	17,424	8 "	x	8 "	680

QUANTITY OF SEED REQUIRED FOR VARIOUS CROPS.

Asparagus.—1 oz. to 100 ft. of drill; 2 lbs. will provide roots for 1 acre.

Beans.—1 pint to 100 ft. of drill; 1¼ bus. per acre.

Beet.—1 oz. to 50 ft. of row; 4 lbs. per acre.

Brussels Sprouts.—¼ oz. to 100 ft.

Cabbage.—1 oz. to 300 ft. of drill; 1 oz. produces 2,000 to 3,500 plants; 1 lb. seed outdoors, 20,000 to 30,000.

Carrot.—½ oz. to 100 ft. drill; 2½ lbs. to acre.

Cauliflower.—1 oz. 2,500 plants.

Celery.—⅓ oz. per 100 ft. drill; 1 oz. produces 10,000 plants.

Corn.—¼ to ½ pint to 100 hills; 1 peck per acre.

Cucumbers.—1 to 2 ozs. to 100 hills; 1 to 2 lbs. per acre.

Egg Plant.—1 oz. produces 2,000 plants.

Endive.—¼ oz. to 100 ft. of drill; 4½ lbs. per acre.

Kale.—1 oz. to 300 ft. of drill.

Kohlrabi.—1 oz. to 300 ft. of drill; 4 lbs. per acre.

Leek.—1 oz. to 100 ft. of drill; 4 lbs. per acre.
Lettuce.—¼ oz. to 100 ft. of drill; 3 lbs. per acre.
Melons (Musk).—2 ozs. per 100 hills; 4 x 4 ft.; 2 lbs. per acre.
Onion.—½ oz. to 100 ft. drill; 4 to 5 lbs. per acre.
Onion Sets.—1 quart to 50 ft. drill; 8 bus. per acre.
Parsley.—½ oz. to 100 ft. of drill; 3 lbs. per acre.
Peas.—1 to 2 pints to 100 ft. drill; 1½ to 2½ bus. per acre.
Pepper.—1 oz. produces 1,500 plants.
Radish.—1 oz. to 100 ft. row; 10 to 12 lbs. per acre.
Rhubarb.—1 oz. seed to 125 ft. of drill; 3½ lbs. per acre.
Salsify.—1 oz. seed to 100 ft. drill; 8 lbs. per acre.
Spinach.—1 oz. to 100 ft. of drill; 5 to 6 lbs. per acre in drills; 30 lbs. per acre broadcast.
Squash.—8 ozs. to 100 hills.
Tomato.—1 oz. produces 2,000 to 2,500 plants.
Turnip.—1 oz. to 200 ft. of drill; 1 to 2 lbs. per acre.

ARTICHOKES.

The tuberous rooted artichoke is grown to a very limited extent in this Province. Commercially it is not a money-making crop on a large scale and only a few growers have any artichokes. Kitchen gardens do not generally have this crop, because of the rank growth of the plant and also because the crop, if not given attention, soon develops into a weed.

The tubers should be planted in rows at least 30 inches apart, and many prefer to set them 3 ft. by 4 ft., which allows for clean cultivation and gives the plant plenty of room to grow. Oftentimes a steep hillside is planted to this crop.

Cultivate as for potatoes.

Dig in the fall, and all the land should be thoroughly dug over, for any tubers left in the soil will soon infest the ground with weeds.

Crop should be stored the same way as potatoes.

The demand for good artichokes is increasing.

ASPARAGUS.

Asparagus is one of the first garden crops which come through the ground in the early spring. In a well cultivated healthy patch the tender shoots appear very early and afford a pleasant fresh vegetable food. This crop is easily grown and requires very little care during the season as compared with many of the other vegetable crops. It has a peculiar flavor which most people relish, and considering the comparative ease with which it can be grown, should be found in the back yard gardens of many city people as well as in the kitchen gardens on every farm. Vegetable growers find in this crop a source of income in the early months of the season before many of the other vegetables are barely planted. Truck growers, or those who grow this crop to any large extent for outside markets or for canning purposes, consider that a well-established patch of asparagus is one of their best money makers. In the Niagara district some large fruit growers have adopted this crop as an inter crop and also as one to which they can look for considerable income while waiting for young orchards to come into bearing. Asparagus requires sufficient cultivation and manuring to keep the orchard in a good state of fertility, and yet it is not such a gross feeder as to diminish to any appreciable extent the supply of plant food required by the orchard. Asparagus needs cultivation and attention at such times of the year that it does not hinder in any way the operations of the orchard.

Asparagus roots are grown from seed. This does not in all cases come true to name. The seeds are usually sown rather thinly in rows three feet apart in the months of April or May as soon as the soil becomes warm. With a seed drill use five pounds per acre. When the seedlings are from 2 to 3 inches high they are thinned out so as to stand about three inches apart in the rows, the strongest plants being left. Frequent cultivation is advised, and it is necessary to keep down all weeds. From 60,000 to 80,000 seedlings can be successfully grown per acre, and these can be sold at from $2.50 to $4.00 per 100. Where one has the convenience of a greenhouse, the seed can be sown during the winter in flats and in the greenhouse temperature the plants will quickly grow and be ready to be transplanted during the spring or early summer. The seed should be sown thinly in rows three inches apart and at a depth of one-half inch. Slightly cover the seeds with soil and place flats on or near the heating pipes. Many plants can be grown in this way and a year gained on the outside method. Of course care must be taken to carefully harden these young plants off in cold frames before attempting to permanently plant them in the field.

Asparagus will grow well on any soil from a sand to a heavy clay, but does well in a good garden soil of a sandy loam nature. Stony and gravelly soil should not be used for an asparagus bed. The soil should be rich and be in a good condition, well cultivated and not worn out. It will prove worth while to fit a soil one year previous to its being used as an asparagus bed. Thorough ploughing, disking and harrowing will give results on this crop. Twenty-five feet of a row will be sufficient for an average family.

This crop is one which must be well fed. Many vegetable growers annually top dress their asparagus patches with from 20 to 50 tons of good manure per acre. This should be applied directly after the cutting season is over. Contrary to the general belief this is the proper time to apply any manure to this crop, for it is at this time that the plant commences to store up its food and prepare the shoots for the next spring's crop. As above stated, 20 to 50 tons per acre is a good dressing or on a smaller plot three to four inches of ordinary horse or barnyard manure will not be any too much. A top dressing of nitrate of soda of 200 pounds per acre will hurry the crop along in the spring. This can be applied by sprinkling the nitrate around the root and by raking or harrowing it it in. Care should be taken that none of this should touch the tender shoots, as considerable damage will result from burning. Hen manure has been found to give excellent results on this crop, but on account of its high percentage of nitrogen cannot be used in such large quantities. A good covering of this manure can be given without danger of damage. This manure should be disked in where possible or hoed in when not. More good than harm will come from a good thorough disking of the asparagus patch immediately following the cutting season. It is the custom of many of the large asparagus growers t disk the ground between the rows and over the rows to a depth of three to fou inches. This should be done so as to loosen the soil to allow air to circulat and allow moisture to get in and also to work in the heavy coating of manure so tha the plants will receive immediate benefit. This point is one which many gardener will do well to pay more attention to, and it is certain large yields of asparagus o a superior quality will result. Another good method is to open up a furrow between the two rows and pile the manure in this. The earth can be drawn back over the manure with a disk harrow or scuffler.

One-year-old plants give the best results in setting out a new asparagus bed, because there is less danger of the plants receiving any serious check at this age than at any other. Good healthy, stocky plants should be used and great care should be taken to ensure that all weak spindly ones should be discarded. On this depends a large amount of the success that is reached when the crop comes into bearing. Where this practice has not been rigidly adhered to, it is quite possible to pick out the weak crowns from the strong, healthy ones in a patch some five or six years old. It is possible to secure asparagus crowns of two or three years' age. These are sold by all seedsmen, and some years ago this was considered the best way in which to start an asparagus plantation. This idea has practically been given up by all up-to-date vegetable growers. The one-year-old stock will give a cutting just as soon as a three-year-old crown, and it is much easier to handle in the younger and smaller state.

After a thorough spring cultivation of the soil furrows should be run out to a depth of from six to eight inches and from four to five feet apart. This latter distance between the rows is arbitrary, some growers planting four feet and others five feet apart. Both distances prove satisfactory, but it is advantageous to leave plenty of room between the rows in order to have ample room for cultivation and also to leave sufficient room for the roots of the plants to spread. Five feet apart for the rows will prove a very satisfactory distance. The furrows should be made in the shape of a V, and this can be done by running out one furrow and coming back and turning one directly away from this.

The plants can be dibbled in in this furrow or can be simply planted in this by drawing some loose earth around them and afterwards raking in some of the soil to fill in the spaces. The plants should be set from two to three feet apart in the row. The furrow should not be filled in at once but should be gradually filled in by subsequent cultivation as the plant grows. Where crowns are used they should be in furrows ten inches deep and should be covered with from three to four inches of soil which should be firmly tramped down. The furrow should be gradually filled in as above mentioned, planting should be done in the spring as soon as the possibility of severe frosts is over.

The cultivation of the young seedlings should be carefully looked after. Frequent scuffling and hoeing, which will keep down the weeds, will be sufficient during the summer season.

In the mature patch, or one four to five years old, the scuffler should be used as long as the tops will permit during the summer. In early spring a light disking as soon as the land is fit will prove sufficient. The cultivation of a mature patch after the cutting season is over should consist of a thorough disking as previously mentioned. Too much emphasis cannot be given to this point.

HARVESTING.—The asparagus shoots which come through the ground in early spring are the part of the plant which is used for human consumption. These should not be cut on a new patch until the third year after the plants have been set. This must be carefully watched, for if the young plants are subjected to a heavy cutting while young they will receive such a severe check that they very seldom reach the stage of a healthy crop-producing plant. It will pay to wait until the plant has become thoroughly established before cutting is commenced.

The crop is harvested by means of cutting the young shoots off under the surface of the ground about an inch or an inch and a half. This is best done by means of a long butcher knife which should be inserted in the ground close to the stalk at an angle so as to cut off the stalk with a sloping end and yet not to cut off the young shoots which have not yet reached the surface of the soil. This can be easily done after a little practice, and it will be found that by taking the shoot in the left hand and gently inserting the knife and cutting off the shoots a large number of hills can be gone over in a short time. The shoots should not be cut unless they are above the surface of the ground six inches. It is advisable to go over the patch every other day and to cut everything that is marketable, because these tender shoots grow rapidly, and if allowed to remain growing long become woody and are not suitable for use. It will be found that many shoots will come through the ground and only be the size of a darning needle. It is advisable to cut these as well and throw them away. Leave nothing all through cutting season because it will only weaken the plant and harbor insects.

If bleached or white asparagus is grown, it should be cut when the tip is barely coming through the surface of the ground which has been moulded up over the crowns to a height of ten or twelve inches.

The cutting season on a young patch should not be much over three weeks, but in a mature plot the season should extend to July 1st. It is not advisable to cut after this date, and if it is done the patch will soon be worn out and dead.

Asparagus is usually marketed in bunches, the size of which depends on the market. Usually as much as can be easily held in one hand constitutes a bunch The stalks are trimmed with a knife after grading so that the butt ends as well as the tip ends are even and have a trim appearance. These bunches are usually tied with two bands of ordinary bunching twine, one near the tip and the other near the butt end of the bunch. Elastic bands, raffia, or colored twine are also used. If so desired, these bunches can be kept thoroughly fresh by standing them in a pan of water, butt end down. This is done in extremely hot weather to keep the bunches fresh for market. Asparagus is sold by the average vegetable grower in baskets or boxes or any convenient affair to carry it in to town. Where it is shipped to market boxes or baskets holding two to three dozen bunches are used. These should be of light material and yet have sufficient air space left that a good circulation can be kept up and thus overcome the danger of heating. Where this crop is grown for a canning factory it is purchased by the ton and it is usually hauled to the factory either loose in a clean wagon box or in bushel boxes.

The old custom of digging the trench for the asparagus crown, of putting in four or five inches of brick bats, etc., for drainage, is still supposed by some to be the only way to grow asparagus. This method is old fashioned, unnecessary and should not be followed.

The asparagus being a maritime plant or sea-shore plant in its original state has been the cause of many growers adopting the practice of applying large quantities of common salt to the asparagus plot. This theory has been exploded and revived many times in the history of vegetable growing and it can be definitely stated that just as good a crop of asparagus can be grown without the use of sal as with it. Phenomenal yields after the use of salt can usually be traced to som other cause. In no case will a heavy application of salt pay for itself in increase yield, but it is useful as a weed destroyer.

In the fall, the tops should be cut off a couple of inches from the ground, carried off the patch and burned. This will destroy all disease spores and insects which might otherwise cause considerable damage to the next season's crop.

BEANS.

Wax beans are of easy culture and should be found in all kitchen gardens. It is doubtful if they rank very high as a moneymaker for the vegetable grower, because they require considerable time in harvesting. Wax beans are the only sort that can be grown successfully in Ontario. Pole beans do not thrive owing to climate.

Soil.—Beans require a warm loamy soil full of humus for best results.

Planting.—This crop is usually planted by hand in rows 30 inches apart. The easiest and safest method is to open a furrow one and one-half inches deep with the corner of a hand hoe, plant the beans three inches apart and cover lightly with soil. Too much soil holds back germination. Some growers follow the plan of placing three or four beans in hills 12 to 18 by 30 inches apart. These openings can be made with an ordinary hoe and should be shallow.

Cultivation.—Cultivate sufficient to keep down weeds with hand and wheel hoe or scuffler.

Harvesting and Marketing.—Pull beans by hand. They are usually sold in bulk or in 11-quart baskets.

BEETS.

Beets are one of the easiest vegetables to grow. They should be found in all farmers' gardens, as well as in the majority of city gardens. This crop is usually grown from seed planted on the level in the garden by means of an ordinary seed drill. It is not advisable to ridge up the soil to grow this crop successfully. The rows should be from 14 to 18 inches apart.

Soil.—Beets do well on almost any garden soil, but thrive best in sandy loam. They may be fairly well grown on heavy soils. The best soil for growth of this crop should contain an abundance of vegetable matter.

Manure.—It is not advisable to use fresh manure on beet soil. Much better is the practice of giving abundant applications of well rotted manure. Fresh manure may be applied in the fall and plowed in, thus requiring only disking in the spring.

Planting.—Plant with ordinary seed drill in rows 14 to 18 inches apart as soon as possible in the spring. For a late crop the seed can be planted as late as the end of July.

Cultivation.—Beets are usually cultivated with the wheel hoe and hand hoe. This should be done immediately after the young plants show through the ground. The beets should be thinned to four to five inches apart in the row for early, and one and one-half for late.

Harvesting.—Beets for early market should be pulled when one and one-half to two inches in diameter. They should be washed clean and all dead or withered leaves removed and tied in bunches of three to five.

For winter use they should be pulled before danger of severe fall frosts. The tops should be twisted off instead of being cut off with a knife, as this will cause bleeding and decay is liable to set in.

Marketing.—For the early local market beets are sold with the tops on in bunches of three.

Winter beets are sold in bushel boxes or, when shipped, usually in bags.

Storing for Winter.—This crop can be kept satisfactorily in any cool cellar well into the winter. They should be placed in bushel boxes and stored in a comparatively cool part of the cellar and the windows should be darkened. If cellar room is not available beets can be pitted very well and will keep until spring in many cases as well as potatoes.

Transplanting.—Market gardeners make a practice of starting some early beets in the greenhouse or hot-bed. Transplant them in flats and secure a plant three to five inches long for transplanting early in the spring. Many beets are grown direct in the hot-bed and are transplanted from these to the field. They are planted out of doors in rows 15 to 18 inches apart and from four to six inches allowed between the plants. These usually are ready for market a week or ten days earlier than those grown from seed.

Started—February 15th to March 1st.

Planted in flat—six to eight weeks later—one to one and a half inches apart.

Transplanted—as early as season opens.

Transplanting—Plant is set and the soil is being firmed around the roots. This should receive attention, so that the young plant will not receive any check.

Transplanting—Making hole with dibber for setting plant.

BROCCOLI.

Broccoli is a practically unknown crop in Ontario. It is very similar to cauliflower, though the heads are more open. The same general directions as for cauliflower are advised. This crop is of no economic importance as yet in Ontario.

BRUSSELS SPROUTS.

Brussels sprouts belong to the same family as cabbages and are somewhat similar to cabbage in flavor. They differ from the cabbage in that sprouts grow from the stalk, which sometimes reaches a height of 18 inches to 2 feet. The sprouts, or small cabbages, come out at intervals on the stem on all sides. This crop is handled in practically the same way as the cabbage crop and can be grown on the same soil.

Sowing Seed.—The seed of Brussels sprouts should be sown in April in spent hotbeds or cold frames. Rows should be two and a half inches apart and the seed should be sown thin enough so that transplanting will be unnecessary. They should be treated in a similar manner to cabbage and cauliflower. They should be planted out of doors as early in the season as possible, two to three feet apart.

Cultivation.—Sprouts should be cultivated with horse scuffler as long as foliage will permit. Like cabbage and cauliflower they respond to frequent and thorough cultivation.

Harvesting.—The sprouts when ready for use are from an inch to an inch and a half in diameter and should then be broken off by hand, or cut off with a sharp knife. This can be done in the field, but usually in the late fall the whole plant is carried into a shed and the sprouts are then cut off more conveniently.

Marketing.—The demand for Brussels sprouts is not as large in the Ontario cities as it is in some cities in the States and yet the crop is easily grown and the sprouts have a more delicate flavor when cooked than cabbage. Sprouts are usually sold in quart baskets or berry boxes.

Storing.—Brussels sprouts should be stored for winter use as directed for cabbage. Some growers make a pile 18 inches high and about 2 feet long and cover with soil. They will commence to decay if stored in larger piles. A cool cellar or shed is an excellent storage for this vegetable.

General Hints.—Brussels sprouts should be grown in every kitchen garden because of their eating qualities. The demand is increasing on the markets of Ontario, particularly in Toronto, during the last five years.

CABBAGE.

Many acres are annually devoted to the production of cabbages, some for early market, and some for storing for winter use, and some for pickling factory purposes. It is an important crop and is considered to be one which will give good average returns year in and year out.

Cabbage is not so particular about the soil in which it is to be grown and it is a crop which is often grown on land which is not adapted to other crops. Any well drained soil holding plenty of plant f [illegible] an available condition should grow excellent crops of cabbage. Land with a l [illegible] gravelly sub-soil should be avoided.

Manuring.—As previously stated there should be an abundance of plant food readily available in a good cabbage soil. This can best be secured by large applications of manure. It is recommended that land for growing a first-class crop of cabbage should receive not less than 20 tons of manure per acre annually. This should be applied in fall or winter as convenient for best results.

Growing Plants.—For an extra early crop of cabbage it is advisable to plant the seed in flats in hotbeds or greenhouses about March 1st. Seed should be sown in drills one-quarter-inch deep and usually covered with sand. The plants should be transplanted before the rough leaf appears into flats and should stand one and a half to two inches apart, particularly the latter distances for very early plants. Two [illegible]e-inch paper or clay pots can be used for this purpose for a limited quant[illegible]

The plants should be carefully watered and given plenty of fresh air to prevent damping off. They should be hardened off in cold frames, so that they will be able to stand any ordinary cold weather after planting out.

For late cabbage the seed is usually sown in a row in the field, or in specially prepared soil, which can be covered with screens to prevent the cabbage root maggot fly laying its eggs. Sow seed for late crop not later than June 1st and transplant not later than July 15th. Seed can be grown quite thickly in the rows.

Planting Out.—Early cabbage plants should be planted on land with a southern exposure, which is usually much warmer than any other. Planting should take place after danger of severe frosts is over. Some growers, desiring to secure an early crop, take long chances with frost and plant very early. Plants should be set 18 inches apart in rows 30 inches apart. Late varieties should be planted 2 x 3 feet on an average garden soil.

The plants to grow very early cabbage are usually dibbled in. Plenty of earth should be kept around the roots and a hole made sufficient to accommodate this. Usually this dibber is made from a broken fork or spade handle, sharpened and being 12 to 15 inches in length. The cabbage ground should be in good condition, so that when the dibber is used the soil can very easily be packed in around the roots. Care should be taken with this part of the planting, for often if the earth is left loose around the roots the plant receives a check which helps to lessen the returns from the crop.

Cabbage or cauliflower plants should be stocky and well balanced before being planted out of doors.

For the late crop on large acreages the horse transplanter is used with good success. This machine drops a quantity of water in the hole where the plant is set. Some growers make a practice of watering the hole in which the plant is to be set in all methods of planting. Another plan adopted is to make a batter of soil and water and in this immerse the roots of the young plants. Cow manure, a little soil and water also makes an excellent preparation in which to immerse the roots.

These methods are all useful, the last one in particular, because the plant has a supply of plant food right at hand and the moisture allows the closer packing of the soil around the roots.

Cultivation.—Cabbage responds readily to cultivation. A fine mulch on the top of the soil which helps materially to conserve moisture is necessary. This can be kept in proper condition by thorough cultivation with a horse scuffler once a week and particularly after each rain. Hand hoeing is unnecessary in fairly clean soil on any acreage. Cultivate until the size of the heads prohibit.

Harvesting.—Early cabbage are cut off the root with a sharp knife just as soon as they are large enough for marketing. Late cabbage are handled in the same manner for early fall sale. For winter sale or storage they are usually pulled up by the root toward the end of the season and stored. Splitting of the heads may be prevented by lifting the head and setting it upside down on top of the soil or by loosening the root.

Storing.—Cabbage can be kept well on into the winter months under proper conditions. Cellars, trenches or pits or regular cabbage storage houses are used. It is absolutely necessary that a good supply of fresh air be available in a cabbage storage. A moist, humid atmosphere will soon ruin the heads in storage.

A common method is to dig a trench three or four feet wide and ten inches deep in a well drained part of the field and stand the cabbage in layers head down, the second layer fitting in between the roots of the first layer. Bring the rows to a peak at the top by cutting down the number in the layers each time. Soil should be piled over these as the season advances and air vents placed at the peak. Cabbage may be kept in the cellar of the house if the temperature is kept low and a good circulation of air is kept up. For best results they should be piled on shelves three or four layers to a shelf, which should have a slat bottom.

Marketing.—Cabbage are shipped in bulk or in slat crates holding one dozen heads. Locally they are sold by the single head or by the dozen.

CARROTS.

Carrots belong to the root crop of garden vegetables. They are grown to a great extent by all vegetable growers as a source of income during the winter months. They are easily grown and require very little cultivation and usually bring in fair returns for the labor that is put into them. This crop, if grown in the kitchen garden, will provide a vegetable noted for its health-giving properties throughout the winter.

Soil.—This vegetable thrives in a good well-drained mellow sandy loam. A sandy loam will produce the smoothest and straightest roots. Very heavy clay tends to make the root rough and rather stumpy. The soil should be free from all weed seeds, for a good crop of weeds will very often smother a good crop of carrots if careful attention is not given. The soil should be of a good condition and should have plenty of manure applied to it in the fall. Preceding this crop fresh manure applied in the spring will usually give a crop of knotty carrots. Rotten manure will be found to be best for this crop on account of number of weed seeds usually found in fresh manure. It is claimed that limeing a carrot ground has no effect on this crop whatever.

Planting.—Carrots are planted in rows on the level, usually two and a half feet apart for horse cultivation, and in a market or kitchen garden in rows 12 to 15 inches apart. An ordinary seed drill is used, and it is advisable to plant a few lettuce seeds as a row mark so that cultivation can commence before the carrot seed germinates. Plant as early in the spring as the soil permits for an early crop. Successive sowings may be made if desired every week or ten days until July 1st. Plants should be thinned to one inch in the row. For late or fall crop sow seed June 1st to 15th.

Cultivation.—This crop should be cultivated only sufficient to keep down the weeds and keep the soil fine and loose. This can be done by means of wheel hoe, hand hoe, and horse cultivator. The seed takes a long time to germinate, and the seedlings are very slender. For these reasons weeds should be kept removed from the rows until the crop is firmly established. The soil should be kept well over the top of root to prevent greening.

Harvesting.—Early carrots for the early market are usually thinned out of the patch that is grown for winter storing. They are pulled out by hand when they are fit to use (one inch in diameter). For the main crop they are usually pulled by hand and topped with a sharp knife. In large fields they are usually piled in the field and covered with the tops and hauled to cellars when the whole field is topped. Harvesting of carrots is usually the last job done on a vegetable garden before it freezes up.

Marketing.—Early carrots are sold in bunches consisting of from five to eight clean, medium sized carrots, having the tops left on. As the season advances the number in the bunch increases. Winter carrots are sold in bushel boxes or ordinary bags.

Wheel hoe in use on small crops.

Storing.—Carrots may be stored satisfactorily in bulk in pits or in cool cellars. No heat should reach them and the windows should be darkened.

CAULIFLOWER.

This is another member of the cabbage family and is probably the one which has the finest quality and also the one which requires the most careful attentio during the growing season. Cauliflower is grown by all market gardeners, and i grown on large acreages for pickling factory purposes. Cauliflower, as a genera rule, is a crop which gives excellent returns on the market. There are exception to this rule, but well bleached heads of fine quality and medium size find a read sale on local markets. Cauliflower is harder to grow than cabbage, though man operations are similar.

Soil.—The soil for early cauliflower should be warm, full of humus and moisture. A soil which dries out quickly should not be used for growing this crop. There must be abundance of humus or vegetable matter in the soil, and this can be secured by large applications of manure.

Growing Young Plants.—Cauliflower plants are grown in practically the same way as cabbage plants, although they are more subject to damping off. For this reason it is advisable to sterilize the soil in which the young plant is to be grown. This is described in a previous paragraph. The seed should be sown in flats from the 1st of March to the 15th. To produce plants which will mature in August, seed is often sown in cold frames as soon as spring opens up. The soil should have a large percentage of sand in it for best results. As a general rule, the flat method of growing is considered the best. Solid beds cannot be controlled as easily and the plants seem to be more liable to damp off and draw.

The plants should be transplanted when the rough leaf appears and can be set in flats or in two-inch pots. Paper pots are used extensively for growing this crop. If so desired, the plants can be transplanted twice. Some growers follow this rule and others are content with but one lifting. Certainly the stronger and larger the plant is when it is transplanted into the open, the earlier the crop and the better the quality of vegetable. For late crop, seed is sown out doors as directed for cabbage, up to May 24th or June 15th.

Manuring.—As a general rule, it is best to manure the season previous for this crop, or at least cultivate the manure in the fall previous. While many follow the practice of spring and winter manuring on the cauliflower land, it is generally taken for granted that the application of fresh manure is not good practice. Nitrate of soda may be used to advantage during the earlier growth of this plant, but should not be applied after the plant commences to head up.

Planting in the Field—The early crop of cauliflower is usually planted 18 inches apart in rows 30 to 36 inches apart. They should be planted fairly deep, but not to cover the leaves, and the dibber is the best tool to use. For the main crop the plants can be dibbled in two feet by three feet, or can be planted with a horse transplanter. In both cases as much soil as possible should be retained around the plant when planting. It is a good plan to water each hole before the plant is set, or at least have the earth around the roots thoroughly soaked.

Cultivation.—This crop should be cultivated sufficiently to keep the soil in a fine condition. As a general rule, the scuffler should be used every week or ten days and always to loosen up the soil after each rain. Cauliflower growers claim the more cultivation given, the better the crop will be. Hand hoeing will be necessary only once if the soil is fairly free from weeds.

Harvesting and Marketing.—When the plant starts to head up and when the head is not more than one and a half inches in diameter, the leaves should be so arranged as to keep the sun from getting in at the flower. In the first stages a leaf or two may be broken over the young head, but as the flower grows, it is advisable to gather the leaves in at the top and tie them with string or raffia. This should be done carefully so as to exclude all light or rain. As a general rule, a gardener will go over his patch of cauliflower twice or three times a week in order to ensure tieing up the plant at the proper stage of growth.

When the head is sufficiently large it should be cut away from the root and the leaves trimmed so that a fringe of leaves is left one and a half inches above the flower all the way round. All dead or withered leaves should be removed. Careful trimming always improves the appearance of the marketable head and ensures top price.

For local markets the cauliflower is usually sold by the dozen heads, which are packed in bushel boxes or strawberry crates.

Cauliflower will not stand rough usage, and for this reason they must be very carefully packed if they are to be shipped any distance. American growers cover the flower with white tissue paper and pack the heads in hay or excelsior in slat crates, or well ventilated barrels. It is imperative that there should be no rubbing of one head against another, for this will damage both and cause a rot to set in.

STORING.—Cauliflowers are not easily stored for any length of time. Some growers, however, annually store some in their cellars for Christmas trade. The plants which have but small heads are lifted roots and all, and replanted in fine moist sand in a cool cellar. The heads will grow if the cellar is kept cool, but very often they commence to rot and the plants cannot be used.

Cauliflower can also be pitted in the same way as cabbage. They should not be piled in too large quantities, for the cauliflower will start to heat in storage more readily than cabbage. Very little dirt should be used as a covering at the start, barely enough to keep out the frost. More should be added as the colder weather advances. A little manure may be thrown over the pit later on.

In cold storage they can be kept in open slat boxes, care being taken that two flowers do not touch. The leaves should not be trimmed as closely as for market, and if practically all the leaves are left on and the plants piled on shelves, best results will be obtained. A temperature of 34 degrees F. will keep large sized heads well on to Christmas.

CELERIAC.

Celeriac is commonly called turnip-rooted celery, having leaves and stalks like celery and a thickened root like a turnip. It is grown practically the same way as late celery excepting the roots are not banked up with soil.

Usually sold in the fall after the leaves have been trimmed off. Very little demand at present.

CELERY.

This crop is grown extensively in many sections throughout the Province, and very remunerative returns are received for the culture of this vegetable. Around the large cities there are considerable acreages devoted to the growing of celery, and some districts make it practically a main crop. Celery can be grown satisfactorily and with success by many more gardeners in the Province. Amateur gardeners can grow it in many cases.

YOUNG PLANTS.—Celery plants should be started in flats in the greenhouse or right in the greenhouse beds. If no greenhouse is available the young plants can be grown in hotbeds. They should be grown in light soil having plenty of humus in it, and should be started as early as February 15th for early celery and not later than March 15th. The seed should be sown in drills two and a half inches apart at a depth of one-quarter inch, barely covering the seeds with very fine soil. It will take from two to three weeks for the seed to germinate, and when they have grown for three weeks the young plants should be transplanted into other flats, or elsewhere in the greenhouse bed, one to one and one-half inches apart. This can be done with a small dibber. This transplanting should cull out all weak, sickly plants and leave only strong, robust ones. By this transplanting a strong root system is grown and a robust plant is ready for final transplanting into the field. The plants in the seedbed may be hastened by placing blotting paper paper or any porous paper (moistened) over the ground where the seed has been planted. This or the use of a pane of glass is used by some gardeners to hasten the germination of the seed. The soil should be watered lightly and with care so that the small seeds will not be disturbed. Watering should be done on a bright day, if possible, about noon. The soil for celery ground preferably is a black muck, but almost any light loamy soil is good for this crop. Light sand which has an abundance of manure incorporated in it makes an excellent soil for growing celery. Strong land should be avoided.

The chief requirements of a first-class celery soil are:

1. That it be well drained.
2. That it be rich in plant food.
3. That it have plenty of moisture available and that it can hold the moisture.

Many garden seeds are germinated quickly by placing glass over the box. This method is followed by many celery growers. Care must be taken to remove the glass once the sprouts show.

A rich sandy loam will produce celery of an A1 quality, crisp, with long stalks and plenty of them. Celery land should not be lacking in plant food. It should be rich in plant food with plenty of humus. If the soil is not well drained it is advisable to secure sufficient means of drainage before celery is grown extensively. This is especially necessary in black muck soils. It is advisable to prepare the soil for one year at least before a crop of celery is attempted. This should include thorough cultivation to open up the soil and make it possible to conserve all available moisture and to kill as many weeds as possible. Large quantities of manure should be ploughed into the soil. Twenty-five to fifty tons of manure to the acre will help to make a good celery soil. This should be ploughed in at intervals and allowed to decay.

Manuring.—Celery is one of the grossest feeders to be found in the vegetable kingdom, and as manure supplies large quantities of plant food and humus it is for this reason that manure should be applied liberally every year. As a general rule it is safe to apply from 35 to 50 tons per acre. This should be well rotted stable manure if possible. This can be applied in the fall after the land has been fitted up or may be applied during the winter months when convenient. It is generally considered best policy to spread the manure at once, not piling it in heaps over the field.

Planting.—Celery should be planted as a rule on the level. No trenching is necessary to grow a good crop of celery. The land should be made as level as possible by means of a drag and the plants put in by means of a dibber, six to eight inches apart in the rows, with the rows from 30 to 40 inches apart. Care must be taken to have the soil carefully packed around the young plant when transplanted, and it is advisable to have as much soil from the plant bed on the roots as possible. Planting should commence in late afternoon when only a limited area is to be planted. Where a large area is to be planted the young plants can be transplanted at any time of the day—a cool, dark day to be preferred in all cases. If the soil has been worked well no watering is necessary.

Celery ground must be cultivated in order to conserve the moisture. This can be done on small patches with a hand hoe. Both shallow and deep cultivation give good results.

Cultivation.—The one-horse scuffler is the best implement to cultivate the celery crop with, and during the early stages of growth the scuffler should be kept busy. This will keep down the weeds and form a mulch which will conserve the moisture. Considerable care should be taken to keep the scuffler from throwing the earth into the heart. Poor results often can be traced to this cause. Where the crop is nearing time for bleaching the cultivation should cease, because the plant will have young rootlets which oftentimes meet between the rows, and these should not be destroyed. It is not often necessary to hand-weed celery if the soil is fairly free from weeds. If these do prove to be very numerous it is advisable to go through the patch and pull out all weeds. Where celery is grown on a small scale a common garden rake or hoe will take the place of the scuffler and a fine mulch should be kept on the surface of the soil.

Time to Mature.—Celery transplanted in the field from May 15th to May 24th will be ready for market where it has been given good attention about the middle of August. The crop will then gradually be made ready as the market demands it.

Bleaching.—To make celery have a fine white appearance, to give a compact head, and to give it a good crisp flavor it is necessary to bleach it in some way. This can be done by various methods, which include the use of 12-inch boards, brown or white paper, wooden boxes, tile, a patent bleacher something similar to ready roofing, and the use of earth. A brief description of each with their merits is as follows:

Twelve-inch Boards.—This method is the most common among vegetable growers and consists in the laying up of two 12-inch boards close to the rows of plants ready to be bleached. Boards 12 or 16 feet in length are usually used. These are pushed in close to the plants and held by a stake driven in at each end. One stake will hold the ends of two boards on one side of the row. The stakes should be about 2 in. x 1 in. x 2½ feet. and should be driven securely into the soil. Some growers simply lay the boards against the celery and do not stake at all. It is better to use the stakes in the majority of cases because the celery will be bleached more evenly and wind and rain will not beat them down. These boards should be carefully piled up in the fall, under cover if convenient, and in all cases should have laths placed between each layer to admit plenty of air. The average life of a celery board is from five to seven years. This method is the most general used and gives good results, the only objection to it being the heavy handling that is necessary in changing from one row to another, and the high cost of the lumber.

Weeding celery by hand when nearly full grown, often necessary to keep down chickweed.

Brown or White Paper.—This consists of wrapping individual plants with heavy brown or white paper and tieing with string. This plan gives satisfactory results but is not economical excepting in patches of very limited area such as a farmer's garden or city garden, and even then it is not economical because of the amount of time and labor necessary to put the paper on.

Wooden Boxes, Tile, etc.—As the object of these is to keep the light away from the plant they are satisfactory from this viewpoint, but on a practical scale they are out of the question because of the time necessary in putting them on. The boxes are made 4 x 4 x 10, and both the box and the tile are simply slipped over the plant. These two should be used only on very small areas.

Patent Bleacher.—A new invention on the market at the present time is a bleacher which is made from some material similar to ready roofing. This comes in rolls 12 inches wide and 100 feet in length. This strip is laid out on the ground and then folded around the plants so that the 100 feet bleaches both sides of 50 feet of row. The bleacher is held close to the plants by means of wires bent in the shape of a long shanked staple. These fit over both sides and hold the bleacher firm. This so far has given excellent results. It bleaches the celery quicker than the boards and is much easier to handle because of its light weight. It is impossible to say whether this will last as long as boards, for it has only been on the market a matter of two or three years. With good care it seems possible that this bleacher will outlive boards and will gradually replace them. It can be secured at a cost of about $18.00 per 1,000 feet.

Celery Bleaching—Showing the arrangement of the patent celery bleacher.

Earth.—Where a crop of celery is grown for winter use it is usually bleached by banking earth up to the plant. This should commence before the plant has fully grown and should be done gradually until the whole plant is covered excepting the leaves. On a commercial scale this can be done by means of a celery hiller which draws the earth up close or one which pushes the earth up to the plants, doing one side of each row at a time. Both kinds give satisfactory results. Where celery is to be bleached with earth it should be planted in rows at least five feet apart in order to give plenty of room for the soil to be drawn from.

HARVESTING.—For immediate sale the celery is usually loosed at the root with a sharp spade and then pulled out. The roots are trimmed with a sharp knife, usually a butcher knife, and piled ready for washing, the outer leaves being stripped off by hand.

WASHING.—A river, spring or pond close to the celery patch is a valuable asset, as the washing can be carried on easily. Where none of these are at hand it is advisable to construct a concrete tank in which to wash the celery. The size of the tank will depend on the quantity of celery to be washed. It is advisable to have the tank not more than 15 to 18 inches deep, and fresh water should be running into it all the time. Cold water should be used. Celery washed in warm water will not keep in shipment as long as that washed in cold water, being liable to wilt very quickly.

MARKETING.—Celery is usually sold on local markets in bunches of twelve heads to a bunch. These are tied together with string, twine or tape, one piece going around the bundle close to the leaves and the other close to the butts. It is necessary that the celery should be thoroughly clean and all diseased or dead leaves removed. Some of the celery which is found on the various markets of the Province is a disgrace to the grower, and it is little wonder that it does not secure the highest market price. Quality counts in celery probably more than in any other vegetable crop. A bunch of clean, well-bleached celery well put up always brings a better price than unsightly, uneven roughly-tied bunches. It is advisable to grade celery into firsts, seconds and if necessary culls. The best celery should be in the first bunches. Celery is shipped in open slat boxes holding from one dozen to three dozen heads per box.

NEW CELERY CULTURE.—One of the improved method of growing celery is known under this name and simply means the growing of the plants so close together that one head bleaches another. With this method the plants are set seven inches apart in the rows, allowing nine inches between the rows or 8 by 8 inches apart. Celery grown after this plan is usually grown in beds from 6-10 feet wide and as long as desired. These beds are separated by a twelve inch path and are so made that cultivation may be carried on satisfactorily. This method is used by some growers who have a very small area. It is absolutely essential that the soil be practically filled with manure and that a good supply of water is available. It can be understood that this is necessary to nourish such heavy feeding plants placed so close together. Cultivation should be done with a hand hoe as long as the plants will allow it. When ready for use a twelve inch board placed on all sides will bleach the outside heads, the others being bleached by those heads close to them. Large returns from a small area result from expert handling of the crop in this manner.

GENERAL HINTS.—Nitrate of soda sprinkled between the rows at the rate of 200 to 300 pounds per acre will force the celery crop along. Celery is often mulched by placing straw manure between the rows to a depth of four to six inches. This should be applied by means of a wheelbarrow on special pieces for early market and when the plants are eight inches high. This is not advised for a large patch, yet some growers follow this practice on patches of an acre and over.

An extensive celery grower near Cleveland, Ohio, makes a practice of tieing all his first-class celery with blue tape, and claims to be increasing his returns per acre by this method. Celery tied with blue tape is known as reliable on the Cleveland market.

WINTER STORAGE.—Celery may be kept fairly well into the winter months by several methods. It can be stored in a regular celery storing house which can be kept at a conveniently low temperature just above freezing, or it can be kept in a cool cellar, or it can be trenched in the field in which it is grown.

For keeping in a storage cellar or an ordinary house cellar it should not be bleached and should be dug in the fall before severe frosts set in. The roots should be trimmed and the plants should be stood up close together in moist sand. Ventilate and keep the window darkened. The trench method is usually the one used by large and small growers who have not the convenience of cellars. A trench 10 to 12 inches wide is dug in a well drained part of the field to a depth sufficient to hold all the plant excepting the very top leaves. The plants are then dug and stood up in this trench as close together as they can be packed. Two boards are then nailed together to form a trough and this is inverted over the trench. Straw and earth are then piled on this as the weather becomes colder. Good celery will be secured after the New Year if this method is followed.

Another method of storing celery used extensively by Mr. A. McInness, of London, is to dig out a trench ten inches deep and four feet wide and as long as necessary to hold several thousand heads. This is then lined on all sides with 12-inch boards. Boards three feet in length with cleats one inch from the ends are then laid up to form the ridge. Manure and earth are piled on as necessary. Ventilation is given by taking off two boards or opening them up some distance.

Storage of celery for winter sale, by Mr. A. McInnes, of London, Ont.

CHINESE CABBAGE.

This vegetable is grown more as a novelty than for anything else, and yet in some sections in the United States it is grown for sale on the market. It resembles a head of Cos Lettuce. It can be grown on any good garden soil. It may be started in greenhouse or out of doors. Plants should be twelve inches apart in the row. It is advisable to use leaves before the seed stalk is formed.

CHIVES.

This hardy crop is practically unknown in Ontario, and yet it is used extensively for flavoring soups, etc. It belongs to the same class as onions and is somewhat similar to them.

This plant thrives on any fertile soil. It is grown from bulbs planted three or four in a place, 15 inches apart in rows 16 to 18 inches apart. When established they will remain for a number of years. When planted early in the spring they can be used the following spring. Chives are sometimes used as young onions, but most generally the tender young leaves are all that are used.

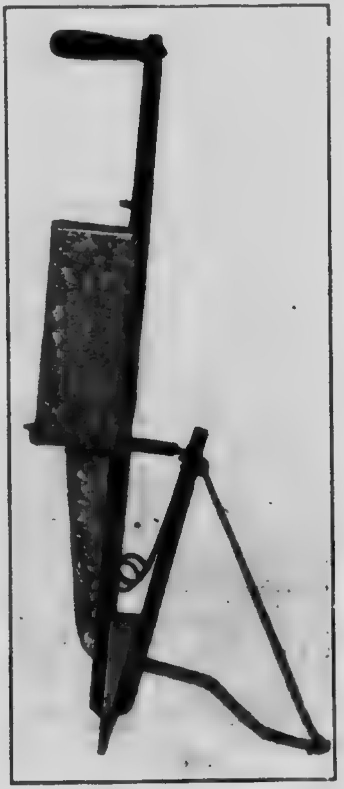
CITRONS.

This vegetable is used entirely for preserving purposes. All kitchen gardens should have a few hills of this crop. Commercially it is not a moneymaker. Any well enriched garden soil will produce good citrons.

Five to ten seeds should be planted in hlls 8 by 8 feet apart.

Ordinary horse cultivation and hand hoeing are all that is necessary.

Fruits are harvested in fall and should be used as soon as possible for decay soon sets in.



A corn planter used by many vegetable growers. A more satisfactory method than with the hoe.

CORN.

Sweet Corn is grown on a small scale by all vegetable growers because there is a ready sale for it on all markets in its season and because it brings in returns early in the season. It is cultivated on a small scale because in this country the demand is not sufficient to warrant large acreages. In the United States some men make a specialty of sweet corn of a high quality and receive large returns from a considerable acreage.

Soil.—Corn will grow readily on almost any soil, and it is generally the poorest land on the vegetable garden on which this crop is grown. It responds readily to heavy applications of manure.

Sowing Seeds.—The seed for early corn is sown in hills three by two feet apart at a depth of one and a half to two inches. The seed is usually planted with a hoe. A small hole is made, four or five seeds dropped in and the earth then replaced and tramped down with the foot. For later plantings make hills four by three feet.

Cultivation.—Ordinary cultivation with a scuffler and a good hoeing not more than twice in the season is all that is necessary for this crop. The first hoeing should be given to kill all weeds not killed by the scuffler, and the second to draw the earth up to the plants as well as to kill weeds.

Time to Mature.—August 15th.

Harvesting.—To tell when the corn is ready for eating the ear is stripped a short way and if the kernels appear solid and a clear white they are ready. The tassel becomes dark brown at this time. The ear is simply bent down with a side twist which loosens it from the stem very easily

Marketing.—The ears are usually placed in [illegible] when pulled and a certain number of dozen placed in each bag. It is taken to the local market in this way.

Forcing.—It has been found to be a paying proposition in a small way to plant two or three seeds in a pot or berry box in the greenhouse and get it started and grown to a height of from six to ten inches, and after hardening off in cold frames to transplant in the field. It is claimed that by doing this ears will be ready for market a week earlier than when planted in the ordinary way. It would not pay to do this on a large scale, but in a few plants it might prove worth while to catch the very early market.

General Hints.—It is advisable to make successional plantings of this crop about every ten days in order to have a new lot of corn coming on fresh after the preceding one has been stripped.

CUCUMBERS.

Cucumbers are grown in the Province to a great extent for pickling factories. Several acres are often grown profitably by one man when he is in a position to secure competent pickers throughout the season. Market gardeners as a general rule grow a limited quantity of cucumbers, usually considering them as a crop of secondary importance as a money-maker. They are easily grown and on good soils large yields are received. This crop is handled in two ways: first for early market and second for main crop purposes. For the very early market the seeds are sown in the greenhouse or hotbed some five to six weeks before it is time for transplanting in field. The seeds are usually sown in pots or quart berry boxes which are filled with good loamy soil or pieces of sods. Seven to eight seeds are usually sown in each pot or basket, and a pane of glass placed over to induce germination. The two healthiest looking plants are left in the box, the weaker ones being destroyed. This leaves but two plants to a box. These are kept in a warm atmosphere, given plenty of light and forced along in order to secure strong healthy plants by May 24th to June 5th.

Transplanting.—These plants are carefully transplanted into rich garden soil in a spot where they will receive plenty of warm sunlight. These should be planted about two feet apart in the row, in rows four to five feet apart, and as much as possible of the soil from the pot or berry box should be left on the roots so that there will be plenty of good soil to keep the plant growing until the roots spread out.

Soil.—The cucumber will grow in any rich garden soil. Best results are usually secured in a good sandy loam.

MANURE.—This crop is one which responds readily to heavy applications of manure. Large quantities of well rotted manure can be applied broadcast or directly in the furrow during ploughing operations. It is advisable to use well rotted manure when possible.

PLANTING SEED.—The main crop of cucumbers is always grown from seed planted in hills or drills. It is not generally supposed that best results are obtained from planting the seed in hills or mounds, though this seems to be the most general practice in this Province. Successful growers plant seven to eight seeds at a depth of one and a half inches, making the hole with a hoe usually. These drills are five feet apart each way. Planting seeds soon after all danger of frosts in the spring will give best results. In growing for the pickle factory an easy method of planting is to use an ordinary seed drill. Sow in rows six feet apart and thin plants to eight and twelve inches apart with a hoe.

CULTIVATION.—These plants should be cultivated carefully so as not to disturb vines, and often during the early stage with a horse scuffler. On patches where space will permit they are cultivated both ways. They should also be hand-hoed sufficient to thin out to four strong plants to a hill and to keep down the weeds. It is a good plan to draw some of the soil up around the stems when young to induce heavy root growth and to keep away insects. When vines become too large for hoe cultivation the weeds should be pulled out by hand or hoed out to keep the patch entirely free from weeds.

PICKING.—Cucumbers should be cut off from the vine leaving about one-quarter inch of stem on the fruit. They should be picked just as often as the market demands so as not to have a large number of over-ripe cucumbers. For pickling purposes it will be found necessary to go over the patch at least every other day.

SHIPPING.—Cucumbers in this Province are usually shipped in 11-quart baskets or small crates.

DANDELION.

Cultivated varieties of the common dandelion are grown to a limited extent by some vegetable growers. The leaves are used in the preparation of salads and in some cases for garnishing, and in most cases for greens. This crop is cultivated around several American cities, but as yet it has not been grown to any great extent in this Province.

SOIL.—A well-enriched soil is recommended for this crop. Any good garden soil will produce a good crop.

PLANTING.—The seed should be planted in rows 14 to 18 inches apart. It can also be planted broadcast, but the row system is recommended as best. If so desired the plants can be started in the greenhouse, transplanted to flats, and finally transplanted in the garden in rows 14 to 18 inches apart and from [illegible] to 10 inches apart in the row. Transplant when danger of frosts is over.

CULTIVATION AND MANURING.—This crop should be cultivated much the same as lettuce. Applications of nitrate of soda, 200 to 300 pounds per acre, will hasten the maturity of the crop and improve flavor. All flowers should be removed as they form.

BLEACHING.—It is recommended that the leaves be bleached when the plant is to be used as a salad. This is done by gathering the leaves together and tieing them with string, much the same way as cauliflower are handled. Boards are sometimes placed close to the plant similar to the method of bleaching celery.

Harvesting.—This whole plant should be pulled out of the ground, the roots trimmed off and the leaves washed and made ready for market. This should be done as soon as heads are large enough to sell or when they are sufficiently bleached.

Marketing.—Dandelions are usually sold in bulk in bushel boxes.

EGG PLANT.

The Egg Plant is a sub-tropical plant very sensitive to frost and one that requires more careful attention during its growth than many other vegetables. It can be grown in Ontario in few sections where danger of late and early frosts are not common and should be grown only to a limited extent as the demand is not large in this Province, and it is not advisable to compete against Southern growers who have better conditions for growing this crop.

Soil.—This crop requires a warm, rich soil, well-manured, of a fine texture.

Starting Plants.—The seed should be sown in flats in the greenhouse or hot-bed about February 15th, and as soon as the rough leaves appear they should be transplanted to 4 or 6 inch pots. The soil and atmosphere should be warm and watering and ventilating should be very carefully attended to. Any extreme of temperature or watering during the germinating period will usually prove disastrous.

Transplanting to Field.—The plants should not be transplanted in the field until all danger of frosts is past and only when the soil and atmosphere are continually warm. They should then be planted in rows 30 to 36 inches between the rows, allowing 18 to 24 inches between the plants.

Cultivation.—This vegetable should have the same general cultivation as tomatoes. This should be done with horse cultivator and hand hoe. All cultivation should cease when fruits reach any size.

Harvesting.—The fruit is cut off so as to leave a portion of the stem and the leaves at the top of the fruit on it.

Marketing.—On local markets this crop is usually handled in baskets or bushel boxes. For shipping, crates similar to those used for shipping melons are used. The Egg Plant stands shipping well and stands up well on the market.

ENDIVE.

This is a vegetable which is known but very little in Ontario, yet in many parts of the United States it is grown extensively. It is a salad crop, the leaves being used for salads when bleached and for greens when not. It is highly relished by those who are familiar with it, and it can be easily grown in the kitchen garden. It should be grown for early summer or for late fall use.

For the early crop the seed should be sown in flats in the hot-bed or greenhouse, transplanted 1½ inches apart, and finally planted in the garden 12 inches apart in the row.

For the late crop the seed should be sown 1st of August thinly in rows 16 inches apart and the plants should be thinned to 6 inches apart.

Soil.—A rich, well-drained soil is necessary for success with this crop. Endive does not thrive to the best advantage on too light or too heavy soils.

Cultivate sufficient to keep down weeds and to keep a fine mulch on the surface of the soil.

Endive is appreciated best when it is well bleached. This is done by tying all the leaves together at the top with raffia or string, or by placing a flower pot over the full-grown head, closing up drainage hole to exclude all light. Another method sometimes used, particularly with the late crop, is to transplant into moist sand in a cool, darkened cellar. Boards may be placed close to the rows in the same manner as for celery bleaching or may be laid on top of the row merely supporting them on 2 inch blocks.

Endive is usually sold in bunches, which vary in size depending on the supply.

HORSE RADISH.

Horse Radish is a crop which is not grown to any great extent in this Province. Very few vegetable-growers produce any, and only a few kitchen gardens have a root or two of this crop. The vegetable-growers claim they cannot secure a market which will be worth while, and the kitchen gardener classes horse radish more as a weed than a vegetable. As a consequence, practically 80 per cent. of horse radish used in Ontario is imported.

Soil.—Horse radish thrives best on a clean, well-drained loamy soil of some depth. Good results are never received on shallow soils or on wet ones.

Planting.—This crop is grown from cuttings from old roots. These should be straight; not gnarled and rough. They should be 5 to 6 inches long and the size of a lead pencil at top end. These are planted in early spring by means of a dibber, 10 to 12 inches apart in rows 3 ft. apart. The sets should be flat on top and pointed on the bottom and should be set straight up in the row and covered with ¾ inch of soil, or in a shallow plow furrow. Cucumbers can be grown in between alternate rows during the first year of growth. Cultivate the same as for carrots or parsnips.

Harvesting.—In the fall of second year the roots should be plowed or dug out, all side roots trimmed off for the next crop, the leaves trimmed off, and long straight roots washed preparatory to selling. These can be stored in cool cellars if desired and should be covered with moist sand when possible. The roots can also be left in the soil over winter and dug the following spring. The side roots which have been trimmed off should be stored in moist sand over winter or until used.

Horse radish should be taken out of the ground every two years, not allowed to grow year after year, for considerable trouble in subsequent crops will come from small roots left in the ground, as they will spread and become troublesome as a weed. Some growers do not replant every two years, however, simply depending on the small roots left in the soil in the fall for the next crop. All shoots in between rows are destroyed.

Horse radish roots should be long, fairly thick, and with but few side roots. Such quality can be secured only in rich, well-manured soils which have been cultivated to considerable depth.

Storing.—Horse radish may be kept satisfactorily in bulk in a cool, darkened cellar. It must not become dried out.

KALE.

This is a member of the cabbage family which does not head up. The leaves are used for greens. It is of no importance as a commercial crop as yet in

Ontario, and it i rdly likely it will reach a popular stage. It can be grown easily for home or for exhibition.

It thrives y soil on which cabbage does well. Seed can be started in greenhouse or l d and cared for as for cabbage. For exhibition purposes the plants should b ransplanted to a large pail or tub, or should be planted in tr field at a distance of 2 ft. by 2 ft. Seed can also be sown out-of-doors and goo plants can be harvested in the fall. Freezing is supposed to improve the flavor.

KOHL-RABI.

This vegetable is not widely grown in Ontario, and yet it is one of the best vegetables that can be obtained for eating. It belongs to the turnip family and has the flavor of a radish and turnip combined. This plant can be cultivated and should be cultivated to a greater extent than it is. All kitchen gardens should have at least a few of this crop.

SOIL.—Rich garden soil is best for this crop. Heavy soil will produce woody plants.

PLANTING AND CULTIVATION.—The seed should be sown in rows the same as carrots or beets. Successional planting ten days or two weeks apart gives best results. Cultivate as for other root crops. Thin to 6 to 8 inches apart.

HARVESTING.—Kohl-rabi really is a turnip growing on top of the ground and should be pulled and trimmed as soon as ready. Kohl-rabi will become pithy if left in the ground too long, and for this reason should be harvested regularly.

MARKETING.—These plants are usually sold in bunches of three with the tops left on.

LEEKS.

Leeks are closely related to onions and resemble them somewhat in shape and yet have a better flavor, not being quite so not and sharp.

Seed is usually sown out of doors in rows 15 inches apart, and the young plants thinned 2 to 3 inches apart. The crop should be handled a good deal the same way as onions. It is advisable to draw some earth up around the bulb toward the end of the season. Leeks are usually sold while green in bunches of six to n.

To store for winter use they should be piled in a sheltered position and a little soil added to cover them from the wind, rain, and frost. They can also be kept in trenches as directed for celery. Ontario markets show an increased demand for this vegetable, good prices usually prevailing for good leeks.

LETTUCE.

Lettuce is the most popular and most extensively grown salad crop. The various uses to which the leaves of this plant have been put have given rise to a demand for this crop the year round. During the winter months it is grown in greenhouses, and during the spring, summer, and fall it is grown in hotbeds, cold frames, and in quite large areas out-of-doors. It is an important crop, and in normal years there is a constant demand for fresh lettuce. It is a crop which is grown extensively in hotbeds during the early spring months, and is grown by many vegetable-growers as a catch crop and also as an intercrop. All kitchen gardens have a short row of lettuce in the spring, because it is generally thought to be the easiest crop grown which affords some green food early in the season.

HOTBED CULTURE.—The seed should be sown in drills barely ¼ inch deep and 4 inches apart as early in the spring as the hotbed is laid down. As a general rule, the seed should be sown thin enough to make thinning unnecessary. Radishes and lettuce may be sown together. Careful attention is necessary in order to give adequate ventilation and watering. The lettuce plant when grown sufficient for use can be pulled out by the roots or can be cut off at the root as desired. Lettuce is also started in the greenhouse and then pricked out into hotbeds or cold frames as the season advances.

Vegetables of quality cannot be grown without plenty of manure in the soil. This shows manure applied to land which has already grown one crop preparatory to growing another.

OUTDOOR CULTURE.—Lettuce, being grown for very early crops out-of-doors, is usually transplanted from hotbeds. The soil should be a sand or sandy loam and should be a warm soil. By this is meant that the soil warms up quickly and early in the spring. A southern exposure is best. A sheltered spot is usually secured if possible, and in some cases windbreaks are used to break the force of prevailing winds. Good drainage is essential and it is desirable that the soil be free from stones, weeds, and other rubbish.

GROWING PLANTS.—As previously stated, it is general practice among vegetable growers to start the first plants in hotbeds and transplant them to the fields when weather conditions are suitable. Plants should be from 2 to 2½ inches long when ready for transplanting. Long spindly plants usually should not be set out. Short stocky plants always give best results.

Seed may be sown in soil out of doors quite early, and, as a general rule, a short row is sown as early as possible with the ordinary seed drill. Rows are usually 12 to 14 inches apart. If sown by hand a very shallow furrow should be made with a lath and the seed barely covered. In small patches the seed can be sown broadcast on top of the soil, and by passing an ordinary rake over the soil a couple of times the seed will be covered sufficiently.

It is always advisable to make several plantings during the season, usually a week or ten days apart. This gives a constant supply of fresh lettuce through the season. For securing extra large heads or for growing head lettuce, the plants should be grown in a thick nursery row and transplanted in rows 12 to 14 inches apart, allowing 8 inches between the plants.

Manuring.—The lettuce being a leaf crop, responds to abundance of manure and humus in the soil. Large quantities of fresh or well-rotted manure should be dug or plowed into a lettuce soil. The richer the soil the better the crop will be. This plant responds readily to application of nitrate of soda. This should be applied at intervals by sprinkling between the rows and raking in; 200 lbs. to the acre makes a good application and a sturdy rapid growth will result.

Cultivation.—The soil should receive sufficient cultivation to keep the surface in a fine condition and to keep down the weeds. This is usually done with a hand hoe, although some use of the wheel-hoe for preserving a mulch between the rows.

Harvesting.—When fully grown or when grown sufficient to use, the plant is usually cut off at the surface of the soil with a sharp knife. It is then placed in a basket and carried to the shed, where it can be washed and it is usually packed in boxes for local market.

Marketing.—Lettuce is usually sold by the dozen heads. For shipping, crates holding 3, 4, 5 dozen are used. Head lettuce is shipped in 54 strawberry crates usually. Large, fine heads are always in demand over small inferior ones, and should always be grown if possible. All dead or withered leaves should be removed.

Head lettuce is grown only to a limited extent in Ontario, because many gardeners have had considerable difficulty in maturing it. A low moist soil is best suited, and the plants should be thinned to one foot apart. The demand is increasing for this kind of lettuce. Cos lettuce or Romaine is similar to leaf lettuce, but has a straighter and more erect leaf. The culture of this variety is practically the same as leaf lettuce, excepting that the leaves are tied together when they are nearly full grown to bleach the inside.

MUSKMELONS.

Muskmelons are grown extensively in the warmer counties of the Province, particularly for the early market. The district around Leamington, in Essex County, annually grows large quantities for shipping to all parts of Canada. Other sections, while not able to compete with Leamington for earliness, grow large quantities for local markets. The muskmelon has become more popular since introducing a melon of the small type. The large melons in most cases have none of the superior flavor which has been reached in many of the small type varieties.

Growing Plants.—For securing early plants the seed should be sown in hotbeds or greenhouses five weeks before the plants can be transplanted into the field. In many cases the seed is sown in two-inch pots. One plant is grown to a pot, although two or more seeds are sown in order to secure a strong plant. When the roots fill the pot the plant should be transplanted to a four-inch pot or an ordinary strawberry basket. The soil in these pots should be very rich and should contain considerable sand. Some growers place an inch or an inch and a-half of well-rotted manure in the bottom of the pot. The plants should be grown in a warm atmosphere and should never be over-watered. Considerable care is necessary to grow good stocky plants which will bear early fruit. Another method commonly used is that of planting several seeds in a piece of sod four inches square, the grass side being turned down. The sods are laid flat in a hot-bed and plants and sod are transplanted to field as soon as weather is suitable.

Soil.—Melons thrive best on sandy land which has large quantities of manure well worked into it. It must be well drained and a soil which warms up early in the spring. A sheltered southern slope is the ideal location for this crop. Heavy soils will not give a good crop of melons of first-class flavor unless by the addition of quantities of manure it has been made more porous and possessing abundant plant food.

Cucumber plant ready for transplanting out of doors, grown in berry box. This assures an early yield. Muskmelons may be started in the same way.

Planting.—Following the method previously described, the melon plants should be set at a distance of six feet each way. All earth around the roots should be planted in the furrow. For planting in districts where late spring frosts often occur the melons are often grown in frames having sash for covering at night. In this way two melon vines are grown to each sash, the hills being placed at either end of the frame. Another system which is followed by some growers, is that of digging a trench 14 to 16 inches deep and 12 inches in diameter. This is filled with ten inches of fresh horse manure, four inches of soil are added, and the melon plant, or even seeds of the melon, are placed in this. A small frame, to accommodate one light of 10 x 12 glass, is in reality a miniature hot-bed, and should be handled similarly with the exception of watering. It is advisable to keep the glass on during the night until all danger of frost is over. This small forcer will help the seed to germinate quickly and will keep the plants growing rapidly. No water should be given in growing plants after this method. Seeds are often sown in hills six feet apart each way in the field. This should be done when the season is well advanced and warm weather is assured. Usually five or six seeds are planted to the hill, depending on the germination, and only one strong plant left to a hill. A spent hotbed can be used for growing extra fine melons, the rotted manure making an excellent feeding ground for the roots.

Cultivation.—Melons should be carefully cultivated in the field with a horse cultivator and with a hand hoe. This should be done every week as long as the vines will permit. Keeping a fine mulch on the surface of the soil is necessary to keep the melons growing rapidly. While hand hoeing it is generally a good practice to draw a little earth up around the plants during the young stages of growth. This gives the melons a stronger stem and affords a stronger anchorage for the plants. It is imperative that while cultivating the vines they should not be moved in any way, as considerable damage will result.

Watering.—It is not advisable to water melon plants. Usually the plants can secure sufficient moisture from the soil if careful cultivation of the soil is carried on during the growing season.

Handling.—It is advisable, when possible, to turn the melons several times while they are growing. This could not be carried on economically on a large scale, but where only a few melons are grown, the quality of the resulting fruit will be superior if the melon is not allowed to mature on one side. A shingle placed under each melon will prevent any discoloration on the side of the melon.

Harvesting and Marketing.—For immediate sale or use the melons should be gathered when the stem separates from the melon with slight pressure from the thumb. For shipping purposes they have to be gathered somewhat earlier and in a green state. They ripen during shipment, but lose the flavor characteristic of a melon allowed to ripen on the vine.

For local markets muskmelons are sold in bulk, being drawn in in wagons or in large boxes.

For shipping the melons are graded as to size and shipped in various carriers. Some use slat crates, others large wicker baskets lined with hay, and others ordinary 11-quart baskets with a slat top. It is imperative that the carrier be so made that there will be plenty of air space around the melons, for they will soon commence to decompose if otherwise shipped.

MUSTARD.

Cultivated forms of mustard are sometimes planted for salad crops or for a green crop.

Seed should be sown in warm sandy loam soil as early in the spring as possible. Rows should be 12 to 14 inches apart and the seed should be sown somewhat thicker than for lettuce.

The tender young leaves are used for salad purposes and later for greens, the same as spinach.

Successional plantings should be made every week or ten days until June 1st

This crop is of little commercial value in Ontario.

ONIONS.

The onion ranks high in commercial importance among the vegetables grown in Ontario. Next to the potato it is the most common vegetable in the home. It is an important crop for market gardeners near our large cities, and large areas are set aside annually for this crop, the most important of these being in the districts of Pelee Marsh near Leamington, and Sarnia. Market prices vary from year to year, but average prices afford excellent returns for the production of this crop, and, in spite of the fact that Ontario annually produces many thousands of bushels, the imports are very heavy. For this reason an increased production in this crop is warranted, and also because the onion is a staple crop enjoyed in practically all households, because it can easily be kept over the winter months when properly grown and cured.

Soil.—The onion is easily adapted to many soils and a soil which is not originally conducive to the growth of a satisfactory crop, can readily be made productive by the application of quantities of manure. Sandy and sandy loam soils are excellent for this crop, and black mucks properly handled are probably the most favorable soils for onion growing in Ontario. The largest areas of onions in Ontario are grown on reclaimed muck soils. It is advisable in all cases to secure a soil rich in vegetable matter, fairly level, well drained and as free as possible from stones. A soil of this nature will produce onions possessing large bulbs of excellent quality, provided careful cultural methods are followed.

Manuring and Fertilizing.—Land to produce good crops of onions should be manured heavily, excepting in the case of black mucks. It is a good practice to apply well-rotted manure, but this cannot always be secured handily. In any case a sand or sandy loam soil should receive annual applications of from 35 to 50 tons of manure per acre. Manure should be applied in the fall and plowed in. Disking the soil in the spring will be all that is necessary if this is followed. Black muck soils can be handled satisfactorily with the aid of commercial fertilizers. One consisting of two per cent. nitrogen, eight per cent. phosphoric acid, ten per cent. potash, supplemented with applications of nitrate of soda, used as a top dressing, gives good results. This should be applied during the growing season at the rate of 150 to 200 lbs. per acre, spreading the same between the rows. This will give sufficient nitrogen and at such times as the crop needs it most to tide over a period of drought. Applications should be made several weeks apart. Many growers in this Province depend only on large quantities of barnyard manure, while others who cannot secure a ready supply use as much as possible with commercial fertilizers. Large quantities of potash give excellent results on muck land with this crop.

In some cases onions are grown on the same soils many years in succession. Where this is practiced, liming the soil once in three years is advisable. From 1,000 lbs. to a ton of lime should be applied to the acre, either in spring or fall, as convenient. This corrects acidity and improves the general condition of the soil, resulting in better yields. This applies particularly to muck soils.

Planting.—By far the greatest number of onions in Ontario are grown from seed planted in the field. This seed should be of unquestionable quality and germinating value. Seed should be planted in rows 12 to 15 inches apart. Sufficient seed should be used to produce eight to ten plants in 12 inches. Extensive growers use from four and a half to six pounds per acre, depending on quality of seed and soil. Seed should be covered by one-quarter inch of soil in fairly heavy soils, and by half-inch in light soils. It is imperative that the seed drill be accurately set to sow the seed as directed.

Cultivation.—If onions are properly drilled in, thinning is unnecessary. Weeds should be kept down by constant cultivation by means of a wheel hoe, which also stirs up the soil between the rows. Hand weeding will be necessary at least once a season, or oftener, if the onion land is very weedy. This is an expensive operation necessary in growing onions, and the freer the soil is from weeds the cheaper the cost of production. It is advisable to commence cultivation as soon as the crop can be seen. Automatic onion weeders have not proved satisfactory in several districts in the Province.

HARVESTING.—Maturity of the crop is indicated by a drying and falling over of the tops. The roots of the onions die off at the same time as the tops, and the onion should be pulled when the roots are almost entirely dead. If left in the soil after this period the onion sends out fresh roots and also starts fresh growth of the stem inside the bulb, which causes considerable loss during storage. Onions are usually pulled by hand and four rows laid in one windrow usually butt to butt. They should be allowed to dry for three or four days in this position, when the sun and wind will almost completely dry up the tops. After this is accomplished it is advisable to take the onions in slat boxes to a shed to allow curing to take place.

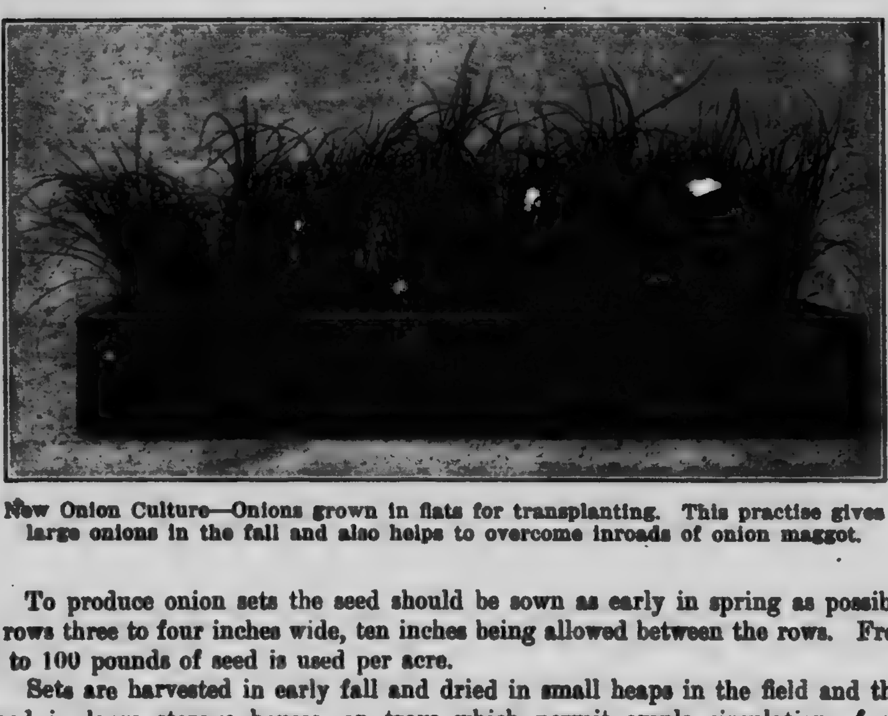
of over-production, as it is called, but owing to immense quantities of onions of inferior quality and grading being literally dumped on the market.

STORING.—Onions should not be stored for winter keeping in bags or in bulk. They should not be stored with other vegetables, because they tend to taint the flavor of other vegetables and moisture conditions cannot be controlled as well. They should be kept on shelves with slat bottoms or in open slat boxes, so that there will be plenty of space for air circulation. If placed on shelves the layers should not be more than ten to twelve inches thick. The cellar of the home can be used satisfactorily if it is kept cool. In the home they can easily be kept in 11-quart baskets suspended from the ceiling of the cellar. When the crop is large they should be stored in cool, dry, well ventilated buildings, and the temperature should remain as close to freezing as possible. Freezing and thawing will cause the onion to rot.

The seed is sown in flats in rows two and a half inches apart in fine soil. Plants must receive careful attention to prevent damping off. Tops may be clipped off with shears when five inches high. This trimming will induce stocky growth. This should be practiced every week, keeping the tops at a height of three and a half to four inches. Many growers plant seed direct in the hotbed and transplant from there. Same general directions are used in this case.

When danger of severe spring frosts is over, these onions, which should be three-sixteenths inches in diameter, are transplanted into the field eight inches apart and eighteen inches to three feet between the rows—the latter when another crop is grown between the rows. With careful handling large bulbs will be harvested, many weighing one and one-half pounds, two pounds and over.

Onion Sets.—Onion set growing is also an important branch of onion business in Ontario. One section (Hensall) puts out over 70 acres and produces immense quantities of onion sets for distribution to all parts of Canada.



New Onion Culture—Onions grown in flats for transplanting. This practise gives large onions in the fall and also helps to overcome inroads of onion maggot.

To produce onion sets the seed should be sown as early in spring as possible, in rows three to four inches wide, ten inches being allowed between the rows. From 80 to 100 pounds of seed is used per acre.

Sets are harvested in early fall and dried in small heaps in the field and then cured in large storage houses, on trays which permit ample circulation of air. Five tons is the average yield per acre.

Green Onions.—Green onions for bunching purposes are also an important crop. These are secured from onions grown from seed sown six to eight weeks before freezing up in the fall or about August 1st. These winter over and in spring a rapid growth produces green onions. Many are grown from small onions planted in warm soil as soon as land is in fit condition to work in the spring.

Many thousands of bunches of green onions are sold annually on our markets and the demand is gradually increasing.

White perennial onions are also grown for bunching purposes. These are planted from the middle of August to 1st of September, in rows 15 inches apart. Onions should be set two inches apart in the row. These produce good green onions the following spring.

Shallots are handled in the same way, but are not in favor with vegetable growers, because the tops are too small and are very easily broken.

PARSLEY.

Parsley is grown in limited quantities by all market gardeners and should be grown by all vegetable growers. It is not grown commercially on a large scale anywhere in Ontario. It is used extensively for garnishing purposes.

This crop is one that is not so particular about the soil requirements in which it is to be grown. Any good garden soil which is well drained will produce good parsley.

Onion Sets, growing near Hensall, Ont. An important industry in that section.

Parsley is grown in flats in the greenhouse or hotbed and transplanted out doors in early spring, in rows 15 to 16 inches apart and 10 inches apart in the row. It is also grown from seed sown in rows 15 to 16 inches apart. Sowing should take place as soon as the soil is fit.

Cultivate with wheel hoe and hand hoe.

Applications of nitrate of soda will hasten the growth.

The leaves are picked when the stem is four to five inches long, and tied in small bunches with string. The size of the bunches depends on the market, varying from one-quarter inch to one inch in diameter at the base.

Parsley is shipped from the Southern States in barrels. Demand is increasing in Ontario.

PARSNIPS.

The Parsnip is another important root crop among vegetables. It is not grown to the extent that either beets or carrots are, because of the limited ways of preparing it for consumption. In spite of this there is a steady demand on all markets for this vegetable and fair profits can be secured by selling during the winter months. Every kitchen garden should have a quantity of this vegetable for winter use.

Good garden soil of a medium heavy nature produces the best parsnips in Ontario. The soil should be fairly rich but extra large applications of manure are not required. A well cultivated deep soil is best. Fresh manure should not be used.

Seeds are sown as early in the spring as possible, in rows 15 to 18 inches apart, for wheel hoe cultivation and 24 to 30 for horse cultivation. The seed is usually slow in germinating and it is advisable to sow a few radish or lettuce seeds to serve as a marker for early cultivation. The plants should be thinned to four inches apart in the rows. Cultivate with a wheel hoe, hand hoe or horse cultivator sufficient to keep down weeds and to keep a fine mulch on the surface.

Parsnips are usually harvested in the fall by digging with an ordinary spade, or plowing them out and topping in the field with a sharp knife. Of later years there has been quite a demand for bunched parsnips just as soon as they are large enough to use. When sold in this manner the roots and leaves are both sold, being thoroughly washed and tied in bunches of from 3 to 6 as the market demands.

By far the greater quantity of parsnips in this Province is sold during the winter months in bulk. The roots are dug last thing in the fall and stored in a pit out of doors or in a cool cellar. When in the latter moist earth or sand is usually thrown over the pile to prevent drying and withering.

Parsnips may be left in the soil throughout the winter. This practice is supposed to improve the flavor. They should be dug as required and should not be used in spring after growth is more than two inches long.

PEAS.

Garden Peas are a crop which are in demand to a limited extent during the early summer. They are easily grown on a small scale as well as on a large scale. As a money maker for a vegetable grower the cost of labor of harvesting them makes the returns very small. For this reason many of the vegetable growers leave this crop out of their yearly list. In some localities they are grown on a large scale for canning factories and fair returns are received. For the household garden it is advisable to have a few vines, more for home consumption than anything else.

Soil.—This crop will grow on practically any soil. A well-manured, sandy loam is preferable.

Manuring.—The land for peas should have a good supply of manure worked in in the fall and then be cultivated. Ten to fifteen tons to the acre make a good application. Some soils are already too strong for growing peas, and when a huge crop of vines with no pods is found this is usually the result of too much manure. In this case very little manure should be used.

Planting.—Peas are planted as early in the spring as possible. The seed is usually sown in rows two and one-half feet apart, with the seeds one inch or one and one-half inches apart in the rows. These rows should be one and one-half inches in depth. It is often advisable to make additional sowings of this crop every week or ten days on a limited scale, to insure frost protection, and also to give a supply of fresh peas on into the summer months. The last planting should be not later than May 1st, because the hot weather soon destroys the vines, and pods will not fill.

Dwarf varieties are planted in rows 16 inches apart. As the season advances when successional cropping is practised the seed should gradually be covered with more soil until for the last planting the seed should be three inches long.

CULTIVATION.—As a general rule all the cultivation of this crop is carried on by means of hoes, both wheel and hand. The soil should be kept free from weeds and a good mulch on top. This necessitates very little labor.

TRAINING UP.—This crop is sometimes grown on stakes. These usually are limbs of trees stuck in the soil and the pea vine allowed to climb up it. This plan could be followed very well by many household gardeners. On a large scale it is out of the question.

HARVESTING.—The pods when well filled out are picked off by hand. The vegetable grower will not go over his patch oftener than twice, and many only once, as the returns are not worth the labor.

PEPPERS.

Peppers are becoming a popular vegetable on our markets during the fall months. Because of the different varieties being more generally used in the making of pickles and sauces for domestic use, gardeners always make a point of growing a few plants of several varieties.

The plants should be started in hotbeds or greenhouses not later than the first of March, and should receive practically the same attention as tomatoes. A slightly higher temperature will stimulate more rapid growth. They should not be set out in the field until all danger of frost is over. They require a rich, warm sandy loam soil. Plants should be set in rows two feet apart, and allowing one foot between the plants. The same cultivation as for tomatoes is sufficient.

The soil to produce good peppers should be a sandy loam well drained and warm. Heavy soil should never be used, for the plants will produce few fruits but an abundance of leaf.

Peppers when fully matured are sold locally and shipped in 11-quart baskets.

It is highly improbable that this crop could be handled extensively in this Province, because the demand is limited in spite of the fact that it is annually increasing.

POTATOES.

The potato is the most popular vegetable known and is one of the most important farm garden crops in Ontario. It is cultivated extensively in several large districts in the Province, principally in the Counties of Lambton, Norfolk, Middlesex, Peel and Carleton. All counties grow more potatoes than any other vegetable, and the above-mentioned counties have made more of a specialty of potato growing. Potatoes are generally considered to be a farm crop, and yet market gardeners annually grow many bushels, and probably have the ability to grow earlier potatoes and produce a greater yield per acre than the other growers in the Province. The market gardener grows potatoes both for extra early sale and also for main crop purposes. From Ontario the potato is shipped to the

Canadian West, and annually many bags are sent from the Sarnia district to Northern Ontario markets, supplying early potatoes before potatoes from the Rainy River District are obtainable.

Soil.—The vegetable grower aims to have as many potatoes matured and ready for sale as early as possible. $1.50 to $2.00 per bushel trade is what the vegetable grower or market gardener is seeking for. Better to sell one bushel at a high price than two at a low price. Earliness is the prime factor considered by the average market gardener. A light sandy soil is preferred for an early crop. It must be well drained and one which warms up early in the spring. Abundance of manure is applied to potato land. Contrary to the general belief the vegetable grower will secure an excellent yield of clean potatoes on soil which annually receives applications of 25 tons of manure per acre.

Planting.—Vegetable growers, as a general rule, follow the plan of planting two eye sets, 9 to 14 inches apart, in rows 30 inches apart. On sandy loam soil the set is planted at a depth of three to four inches. These are usually planted in furrows made very shallow by the plow. Some plant a few rows by hand, planting the sets in hills 30 inches apart. This is used more particularly when an early yield is required on very weedy soil. Planting this distance apart allows for cultivation both ways.

Sprouting potatoes previous to planting, is practiced in a limited way by some market gardeners. This is done to start the growth in order that the potato plant will be that much ahead throughout the season. It must be understood that this plan is not followed to any great extent, because it increases the cost of production considerably, and time and labor can be better employed on the average vegetable garden. To sprout the seed for this method about ten to thirty days before planting time, the smaller potatoes weighing not less than four ounces, are set in flats or shallow boxes in the greenhouse. They can be set quite close, and the stem end is usually up. The light and heat commence to make the eyes active and by the time of planting the young shoots will be an eighth of an inch to four inches in length. These should not be allowed to grow any longer because they are very brittle, and will snap off during planting.

The potatoes should be planted in the best garden soil obtainable and should be planted fairly shallow with the stem end up. A covering of two inches is sufficient. They can be set 10 inches apart in the row and 24 to 30 inches between the rows. They will have to be planted by hand, and this takes considerable time, which is the drawback in the method. A large yield of early tubers will result from this method in warm soil. Potato sets are usually dropped by hand on small areas. Machines which will plant five acres per day can be purchased at a reasonable cost. Of these the ones which need two men to handle are usually considered best, because with the automatic planter many misses in the field often occur through lodging of a set in the cogs of the planter.

Cultivation.—Potatoes should receive abundant cultivation. Until the young shoots are one to two inches above the surface of the ground they can be cultivated with the light harrow. They should be gone over every week. When the shoots become longer, culivation with a horse scuffler should be continued. This also should be given every week both for the cultivation value, and in order to keep down the weeds by smothering them with earth. It is unnecessary, excepting in very weedy soil, to hoe the potato crop by hand.

Moulding.—When the tops become quite tall, and the season advances, the general practice is to mould the potatoes up by placing mould boards on the scuffler or by running a double mould board plow between the rows. This throws the earth up around the plant and assures plenty of covering for the tubers to expand in and to prevent greening. This moulding up should be done gradually and should take the place of the ordinary cultivation. For early crop this is not necessary.

Harvesting.—Potatoes in small quantities are dug with a digging fork. Plows with a potato lifting attachment are also used. These are plows having iron fingers in place of the mould board and a small share. This is an economical method of digging potatoes on a comparatively small scale.

For large acreages a potato digger fitted with carriers and shakers should be used. It is advisable to secure one which will shake the potatoes from the stems and drop the potatoes in a row and also allow the tops to be dropped in another row. These machines are very heavy, four horses being necessary in many soils. They do good work and should be on every farm, producing more than five acres each year. The most up-to-date potato digger is one which has a gasoline engine to drive the carriers and shakers, thus taking considerable weight from the horses. These machines are also fitted with a box into which the potatoes drop when separated from the tops. The box is emptied by means of a foot-trip similar to that employed on a horse rake. By using a machine of this kind two horses will handle the machine with ease and the potatoes will be left in windrows one bushel in a heap. This makes picking up considerably easier.

An up-to-date vegetable garden near Toronto. Note the straight rows and the arrangement of the crops.

Potatoes are picked up by hand and placed in bags or boxes and stored.

Storing.—Potatoes can be stored in cool, dry cellars. They are usually piled in bulk. Good ventilation is necessary but a moist atmosphere should be avoided. They may also be pitted in the field and kept in good condition in this way. A high, well drained part of the field should be selected and the earth shovelled out to a depth of 12 inches. This excavation should be 4 to 5 feet in width and as long as necessary to accommodate the crop. The tubers should be placed in this pit and they should come to a peak at the top. Straw is then placed over them to a depth of 8-10 inches. and then covered with earth to a depth of six inches. This should be added at intervals until freezing up takes place. Ventilation is given by placing land tile, stove pipes or small wooden boxes at intervals of 10 feet along the peak of the pit. As the season advances and cold weather sets in these should be filled with straw.

Marketing.—Potatoes grown in Ontario are sold principally in the large markets in the Province. Early potatoes as well as late ones are shipped into the Northern Ontario districts. They are marketed in sacks holding 90 pounds net.

PUMPKIN.

This crop is always in demand in the late fall and of later years quite a demand has arisen for pumpkins for canning purposes.

This crop should be grown as a companion crop for corn. The seed should be planted in hills eight to ten feet apart, on the square or in every third or fourth row of corn, after all danger of frost is over. Six to ten seeds are planted to a hill. For extra large-sized pumpkins a small quantity of manure in each hill will help to give desired results. In the fall when the pumpkins have attained their full size and color they can be sold or used for canning. For winter use they should be stored in a cool cellar on shelves or racks, and care should be taken to see that the stalk or stem end of the pumpkin remains on. Pumpkins should not be handled roughly in storing. Rolling them down a chute will cause bruises which will soon develop into a decay. They must also be kept dry. They can be kept well into the winter months.

RADISH.

The radish is probably one of the most popular vegetables to be found on the early markets. It is grown in many kitchen gardens, practically all vegetable gardens, and is even grown as a truck crop, six to ten acres of radishes being grown and handled by one grower. The Ojibwa district in Essex County is famous for its large acreages of radish.

To secure best results with early radish, a warm, loamy soil is best If possible, a soil with a southern slope is best. The land should be well enriched with well-rotted manure.

The seed should be planted in the spring as early as possible, either in drills 15 inches apart, or broadcasted. Some growers grow good radishes in rows eight inches apart. Successional plantings should be made every ten days until the 1st of June. Moist cool soils will grow them all summer.

Very little cultivation is necessary, only enough to keep down weeds being given.

Radishes are pulled when large enough for use and tied in bunches of from five to eight, washed and are ready for market.

For shipping radishes, discarded orange crates can be used successfully. Radishes make a good hotbed crop. They also respond to irrigation later on in the season.

Winter radish seed should be sown in drills about the 1st of July. They should be thinned to four inches. In the fall they should be topped with a knife and stored in the same manner as turnips.

RHUBARB.

Probably this crop is the commonest one in this Province among all classes of gardeners. This plant is found on nearly every farm and kitchen garden This is probably due to the easy manner in which it is started more than to the commercial value of the plant. While many vegetable growers consider this one of the most profitable vegetable crops, the average public consider it as a very minor crop. A patch of rhubarb is a valuable asset to the vegetable gardener because it gives immense yields for very little time and labor expended on it. It is valuable to the household because it is one of the first crops obtainable in the spring and because of its medicinal value.

Rhubarb thrives best in sandy loam and prefers a southern exposure, preferably a side hill. Large acreages are found planted on side hills where it would be inconvenient to grow many of the other vegetable crops. It responds readily to abundant applications of manure and yet even if practically neglected, large yields are to be derived from this plant.

Rhubarb is often forced in the open by covering the crowns with strawy manure. This is the handiest method on large and small areas.

Rhubarb is propagated from seed and from division of the root. If it is desired to grow the plants from seed care must be taken to secure seed from a reliable source. It is not safe to grow plants from one's own saving of seed, for as a general rule the resulting plants will all be different. Seed should be planted in flats in the greenhouse about February 15th. Transplant out of doors when danger of frost is over, placing plants 16 inches apart in the row and 3 feet between the rows. The following spring these plants should be lifted and planted at a depth of 6 inches, 3 by 3 ft. or 4 by 4 ft. preferably the latter distance permanently To start a patch from division of the root, old crowns should be dug in spring or fall and cut up with a spade leaving one eye to a crown. These should be planted as for permanent planting above. Manure should be applied in the spring, a liberal quantity being scattered around the crowns. Barrels, boxes. straw or strawy manure placed over a crown in the spring will hasten growth. Stalks should be pulled with a sideways motion so as not to leave a broken stump on the crown. Plants should not be pulled heavily until well established. Always remove seed stalks when seen.

SALSIFY.

Salsify, or vegetable oyster, is a hardy plant used by many and should be grown more in the kitchen garden. Its good qualities are unknown to many in the Province.

Salsify is a deep-rooted vegetable, something similar to the parsnip, and requires a deep rich loamy soil for best results. It is grown from seed and will be ready for use in one season.

The seed can be sown in rows 15 to 16 inches apart with an ordinary seed drill or by hand. This should be done early in the spring when other vegetable root crops are sown. The plants should be thinned to two to three inches apart. Cultivate with wheel and hand hoe sufficient to keep down weeds. In the fall the crop can be harvested in much the same manner as parsnips. The roots should be dug and placed in the cellar in moistened sand to prevent them from withering. If so desired, this crop may be left in the soil all winter, being dug as required or being used in the early spring.

Salsify is usually sold in bunches of clean even roots, having about three inches of the leaf left on. Six to twelve roots make a bunch.

SPINACH.

Spinach is grown almost entirely for greens. It is a rapid growing spring crop, and the leaves form a large percentage of the greens used in this Province.

Spinach thrives best on a rich sandy loam and also does well on muck soil. The soil should be heavily manured previous to planting seed.

Seed should be sown as early in the spring as possible in rows 12 to 15 inches apart. It should be sown rather thin. Plants should be forced along with applications of nitrate of soda, 200 pounds to the acre or a handful to a square yard. This should be sprinkled between the rows and care taken not to allow any of the nitrate to touch the leaves, as a burn will result. Spinach should be cut with a sharp knife and sold in bulk. For shipping, ordinary barrels with plenty of air holes are used.

SQUASH.

Squash are a crop which take up considerable room in growing owing to the dense vine common with many varieties. As a financial success squash are of minor importance owing to limited demand and the usual low prices received for them. A rich sandy loam well filled with well-rotted manure is the best soil for this crop. The seeds should be planted eight to ten to a hill at a depth of three inches and ten to sixteen feet apart each way; thin to three to four inches. If extra quality is required, a couple of shovels of manure (well-rotted) can be placed in the hill before the seeds are planted. Only the two or three strongest plants should be left, the others being pulled out when young.

Squash can be grown very satisfactorily with corn, planting a few seeds every four to five rows. They should be harvested before freezing and stored in cool, dry cellars. It is a good plan to pile the squash in layers on shelves so that the air can reach all sides of the stored fruit.

Squash and pumpkins require similar storage conditions. The stems must be left on and the squash must be carefully handled. Squash should never be piled.

SWISS CHARD.

This vegetable is practically unknown in this Province. It can be grown easily from seed planted in rows 15 inches apart, the young plants being thinned out to six to eight inches. The leaves are cut back to the root, which is left growing in the ground. The leaves are used for greens and the stem or rib of leaf as asparagus. A few plants should be sufficient for a small family. This crop is of no commercial importance in Ontario as yet.

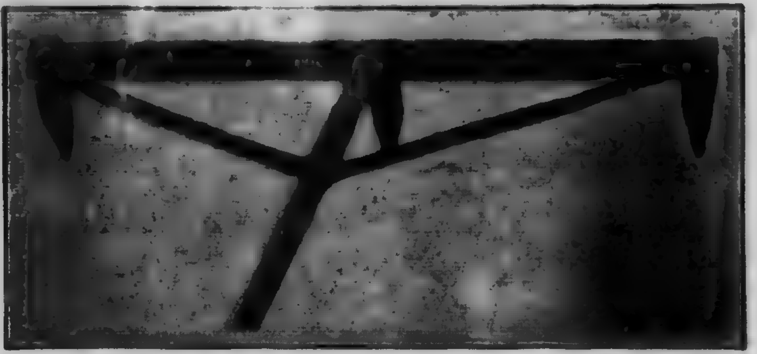
TOMATOES.

Tomatoes are one of the most popular vegetables to be had at the present time. They are grown extensively on large acreages for sale on local or distant markets and they are also grown in larger quantities for canning purposes. Some localities in the Province make a specialty of the early trade, shipping considerable quantities as far west as Calgary, and there has been quite a trade worked up for this early fruit in the Canadian West. Almost every farm and kitchen garden has its few plants of tomatoes for the home use. This crop has many medicinal properties and for this reason, if for none other, it should be grown more and more extensively than it is at the present time. The average kitchen garden tomato plants are of an inferior order, because in many cases the grower does not know a first-class tomato plant when he sees one, and for this reason he buys a small spindly plant which does not do well, and which gives a very poor yield late in the season. Early tomatoes are uncommon in a great majority of the kitchen gardens of this Province. This should not be, and the following notes will help to solve the problem of fairly early fruit, if carefully followed:

Most up-to-date methods of growing strong tomato plants. Berry box, clay pot, paper pot and ordinary flat. These methods give the plants plenty of room to grow in and insure early yields.

Starting Seed.—The seed for an early crop of tomatoes should be sown in the hotbed or greenhouse not later than March 1st. Some growers plant a few days earlier in order to be sure of a good thrifty plant. The seed should be sown in very fine garden soil in plant boxes or flats and a pane of glass placed over to induce quick germination. In four weeks' time these young plants should be ready to prick out. They should be set two by two inches, if sufficient room can be secured, or in any case, one and a half by one and a half inches apart. Three to four weeks later they should again be transplanted, giving them more room. They can be transplanted into three-inch pots, either paper or clay, as desired. In another two to three weeks' time they should be transplanted again into six-inch paper or clay pots, or into quart berry boxes, one plant to a box or pot. Some growers think it advisable to transplant at least four times in order to secure strong, sturdy plants with thick stem and healthy colored foliage. Certainly this helps, and anyone desiring extra early fruit should follow this practice. The larger the root system and the sturdier the growth of the plant, the surer the grower is of an early crop.

For the main crop the seed should be planted a month later, and the plants handled in much the same manner. It does not seem to be the general practice among growers of this crop to be sure of large plants. Probably this is a mistaken idea, and accounts for so many tomatoes being frozen in the fall when a fairly early frost catches them. Just a little more care in the handling of the young plants will be likely to prevent this loss. Men growing for the canning factory trade should not buy the cheapest grade of plants they can, for the plants that are large, fewer in the flat, are those that have been given the most care, and returns from the better class of tomato plants are greatly superior in proportion to the price paid for cheaper ones.



A handy marker for laying off proper distances for transplanting tomatoes.

Soil.—Sandy loam, well-drained and well-manured, makes the best soil for any crop of tomatoes. For the extra early crop they should be planted in a sunny, warm location, facing the south and protected from severe winds. A clover sod makes the best land on which to grow the main crop of tomatoes. Land which will produce a good crop of corn will almost invariably give a good yield of tomatoes.

Manuring.—Liberal applications of manure should be given the land for tomato growing. Many intensive growers use twenty-five two-horse loads per acre. This should be applied preferably in the fall and winter. Fresh manure should not be used immediately before planting as a general rule, although many growers have immense yields from this method. Some soils respond readily to fresh manure and give heavy yields of fruit, while others give a heavy vine and a small yield of fruit from the same treatment. The manure in any case should be thoroughly incorporated in the soil, and when a sufficient supply is available it should be broadcasted, and when the supply is limited, well-rotted manure should be placed in the furrows where the plants are to be set.

Planting.—For the main crop of tomatoes in the majority of sections in the Province should be set four by four feet. For the early crop they can be set somewhat closer, in many cases three by three feet, or three and a half by three and a half feet.

To produce extra early fruit of a good quality the tomatoes are sometimes trained to one stem and supported by stakes or wires. Following this method they can be planted 12 to 16 inches apart in the rows and 3 feet between the rows, or 18 by 18 inches with 18 inches to 2 feet between the rows. This method will be further described in a following section.

The usual method for planting tomatoes is to run out a furrow five inches deep and mark off with a wooden marker the places where the plants are to go. The planting should be done in late afternoon, if possible, on a cool day. The time of month for planting the extra early crop depends on the season, but the sooner they are out in the field the sooner the crop is ready, depending, of course, on frost conditions. This time varies from May 20th to June 5th, according to district and weather conditions. As much as possible of the soil around the roots in the box or pot should be planted. This can be done by thoroughly soaking the soil while in the boxes. The box or paper pot can then be easily removed, leaving the earth intact around the roots. This should be set in the furrow and a couple of inches of soil drawn in around the plant. It is a good plan to draw the soil fairly well up around the stem to give plenty of support in case of wind. By using this furrow method there will be a large part of the furrow left open after planting. This can easily be filled with an ordinary garden rake, or with scuffler working the field crossways. An ideal tomato plant should be six to eight inches in length from top of roots to top of stem, should be one-half inch through the stem at the base, and the leaves should be a dark green color. It is a good thing to have the plant in flower, if not already having some small fruits formed on it, before it is set out in the field. The roots should fill one quart berry box or a six-inch pot. A plant with the foregoing qualifications can be depended upon to give a heavy yield in good soil.

On large acreages, tomatoes can be planted successfully with a horse transplanter. Of course the handling is considerably rougher, and the plants cannot be expected to give as good results. The transplanter opens up the furrow and draws the soil in around the plant which has been set by hand.

STAKING, PRUNING, ETC.—While the training of tomatoes to one stem and tying this to a stake for support has been carried on for a number of years, it is but recently that vegetable growers have paid any attention to this method of raising tomatoes. In many cases the more progressive vegetable growers are trying this method out with more or less success. It is a method which will most surely be adopted by those desiring clean, early fruit, for the fruit will ripen from a week to ten days earlier than by the ordinary flat method. The fruit will not require cleaning, as it does not come in contact with the ground, and the loss through fungus diseases and insects will be minimized for the same reasons. The cost of production is somewhat higher due to increased attention, but the yield is larger owing to the shorter distance apart at which the plants can be set.

PLANTING.—For the individual stake method set the plants 12 to 16 inches apart in rows three feet apart. Stakes, five to six feet long, two and a half inches square, are driven into the soil three inches from the plant. Another method is to build what might be termed a temporary wire fence. Place posts 25 to 30 feet apart, and attach wires lengthwise to these every 12 to 15 inches. Stretch the wires tight and staple them securely. These fences should be three feet apart. The plants can be set as close as 12 inches but 15 inches usually gives better results.

Another method is to plant the tomatoes 18 by 18 inches in the form of a square. Four stakes are then driven in, one to each plant and the tops drawn together and tied with string or wire.

Training and Pruning.—As soon as the plants grow sufficiently they should be tied to the stakes or wires by means of raffia, or string, or pieces of cotton. The tie should be made under a leaf stem to give as much support as possible to the plant. As the plants are being grown very close together and early fruit is being sought after, the plants must be pruned so as to give every chance to the fruit on the main stem. For this reason all side shoots which commence to grow in the axles of leaves should be pressed off with the thumb. This part of the producing end should be carefully looked after. Three to four ties will be found sufficient to hold up the plant, and the estimated cost of staking, pruning and tieing per plant per season is between five and ten cents per plant.

Staking tomatoes produces early fruit of superior quality.

This method should be at least tried out by all progressive vegetable growers on a small scale to decide its merits, and all kitchen garden tomatoes grown on a small scale on a small piece of land should be grown in this manner.

Cultivation.—Tomatoes in the field should be cultivated thoroughly with horse cultivator both ways of the fields. This should be done after every rain and at least once a week until the growth of vines prohibits.

Harvesting and Marketing.—Tomatoes are usually sold in local markets in boxes or baskets. Shipping is almost entirely done in 11-quart baskets with a netting cover. When the tomatoes are to be shipped, they should be picked when they show a yellowish color. For immediate sale should be fairly ripe. A great deal could be done toward improving the quality of tomatoes both shipped and sold locally. A basket or box of clean uniform fruit will always sell better than unclean cracked fruit simply thrown into the carrier. The tomato grower who wishes to establish a reputation for himself should grade his fruit carefully. Competent men should do this grading in the packing-house. Grading cannot be successfully carried on in the field. Only first-class samples should go into a first-class basket. Seconds and culls should have carriers for themselves separately.

The sooner the fruit can be put on the market after picking the better.

TURNIPS.

Turnips grown in the garden are of superior quality to those grown in the field. The vegetable growers aim to secure early turnips of medium size and good flavor. Seed should be sown in drills 15 inches apart as soon as land is in good condition. Thin to 6 inches. Late varieties are planted a month or six weeks later, usually after some early crop such as spinach. Late white turnips may be planted as late as August 15th, and if thinned to 6 to 8 inches in the row will yield well.

Early turnips are pulled when quite small and sold in bunches of three. Late turnips are harvested by pulling and cutting off tops and selling in boxes or bags.

WATER CRESS.

This crop can be grown on any soil that is moist. Low-lying land on the edge of a swamp or on the side of a slow-running stream is best. It can be grown from seed or from divisions of the plant barely planted in the moist soil. It could be grown in the kitchen garden if it were thoroughly watered every day throughout the season. It is much more profitable where a natural supply can be had. When long enough the leaves and stems are cut off with a sharp knife and made up into a small bunch. Once established a bed will last a number of years.

WATERMELONS.

This crop is not grown extensively in any district in the Province. The bulk of the watermelons sold in Ontario markets are imported from the Southern States. All vegetable growers annually plant a few hills of this crop and quite a few kitchen gardens also have a small bed of this crop.

SOIL.—Watermelons thrive best on a fairly open soil, well drained. A sandy loam is best, although a clay soil which is not too heavy will grow good melons. The best soil is a light sand.

PLANTING.—Almost altogether the seed is sown in hills 6 to 8 ft. apart. Seven or eight seeds being planted and three plants being allowed to grow. Very few gardeners start the plants in hotbeds or greenhouses as directed for muskmelons, although the same method may be followed to secure large early melons. Some growers place a fork full of well-rotted manure under the hill. This helps to supply plant food.

CULTIVATION.—The same cultivation as given for muskmelons, cucumbers, etc., is advisable for this crop.
are fully developed and mature. For local markets they are usually hauled in in
HARVESTING AND MARKETING.—Watermelons should be harvested when they
bulk. For shipping they are loaded into cars in bulk.

List of Standard Varieties of Vegetables for Ontario. Recommended for both Commercial and Amateur Gardeners.

Artichoke	Red or White.
Asparagus	Palmetto, Conovers Colossal, Reading Giant.
Beans	Wax—Golden Wax, Davis White Wax. Green—Valentine, Refugee.
Beets	Flat Egyptian, Detroit Dark Red.
Broccoli	Walcheren.
Brussels Sprouts	Dalkeith.
Cabbage	Early—Jersey Wakefield, Copenhagen Market. Main Crop—Glory of Enkhuizen, Short Stem Ball Head. Savoy—Chester Savoy, Green Globe Savoy. Red—Red Rock.
Carrots	Chantenay, Danvers Half Long, Scarlet Nantes, Ox Heart.
Cauliflower	Erfurt, Snowball.
Celeriac	Large Smooth Prague.
Celery	Early—Paris Golden, White Plume—Winter—Winter Queen. Red—London Prize Red.
Chives	Common.
Citron	Colorado Preserving.
Corn	Early—White Cory, Golden Bantam. Main Crop—Perry's Hybrid, Stowell's Evergreen.
Cucumber	White Spine, Improved Long Green Chicago Pickling.
Dandelion	Improved Cabbaging.
Egg Plant	Black Beauty, New York Purple.
Endive	Moss Curled.
Horse Radish	Bohemian.
Kale	Dwarf Scotch.
Kohl Rabi	Carentan.
Lettuce	Grand Rapids, Non Pariel, Big Boston. Trianon—Cos.
Muskmelons	Paul Rose, Osage, Burrell's Gem.
Mustard	English White.
Onion	Seed—Southport Yellow Globe, Southport Red Globe, Danvers Yellow Globe, Red Wethersfield. Pickling—Silver Skin, Barletta. Green—White Welsh, Egyptian. Transplanted—Prizetaker.
Parsley	Champion Moss Curled.
Parsnip	Hollow Crown.
Peas	Early—Gradus, Sutton's Excelsior, American Wonder, Thomas Laxton. Late—Stratagem.
Peppers	Ruby King, Chinese Giant, Large Long Red.
Potatoes	Irish Cobbler, Early Ohio, Delaware, Early Eureka.
Pumpkin	Quaker Pie, Connecticut Field.
Radish	Ne Plus Ultra, Scarlet White Tip Turnip. Winter—China Rose, White Chinese, Round Black Spanish.
Rhubarb	Victoria, Linneaus.

SALSIFY .... Mammoth Sandwich Island.
SPINACH .... Viroflay, Round Leaf Summer.
SQUASH .... Green Hubbard, Golden Hubbard, Boston Marrow, Vegetable Marrow, Bush and English Marrows.
SWISS CHARD .... Silver.
TOMATO .... Red—Earliana, Bonny Best, Chalks Jewel, Red Rock, Red Canner. Pink—Byron Pink, Imperial.
TURNIP .... Golden Ball, Early White Six Weeks.
WATERMELON .... Coles Early, Peerless.

PLANTING TABLE.

This Planting Table for Vegetables is based on results in District of Toronto. Local conditions will vary this to some extent, either earlier or later.

Vegetable.	Seeds or plants necessary for 100 ft. of row.	Time for planting out of doors.	Depth to plant.
Artichokes	10 lbs.	April	3 in.
Asparagus, Seed	1 ounce	May, June	½ in.
Asparagus, Plants	50 plants	May, June	8 in.
Beans, bush	1 pint	May, July	1½–2 in.
Beets	2 ounces	May, July	½ in.
Brussel Sprouts	¼ ounce	May	¼–½ in.
Cabbage, early	¼ ounce	April, May	¼–½ in.
Cabbage, late	¼ ounce	June to July 12	¼–½ in.
Carrot	½ ounce	April, May, Ju	¼–½ in.
Cauliflower	¼ ounce	April, July 12	¼–½ in.
Celery	¼ ounce	May 15, July	⅛ in.
Citron	1 ounce	April, May	1 in.
Corn, sweet	½ pint	May, July	2 in.
Cucumbers	½ ounce	June, July	1 in.
Egg Plant	⅛ ounce	June	½–1 in.
Kale or Barecole	¼ ounce	May	½ in.
Kohl-rabi	¼ ounce	May, June, July	½ in.
Leeks	½ ounce	April	½–1 in.
Lettuce	¼ ounce	Apr., May, June, Aug.	¼ in.
Melon, musk	½ ounce	June	1 in.
Melon, water	1 ounce	June	1 in.
Onion, seeds	½ ounce	April	½–1 in.
Onion, sets	2 qt. sets	April	1–1½ in.
Parsley	¼ ounce	April, May, Aug.	¼ in.
Parsnip	1 ounce	April, May	½–1 in.
Peas	1 quart	April, May, July	2–3 in.
Pepper	½–1 ounce	June	½ in.
Potato, Irish	10 lbs.	April, May	4–6 in.
Pumpkin	½ ounce	June	1–1½ in.
Radish	1 ounce	April, Sept.	½ in.
Rhubarb, plants	33 plants	May	2–3 in.
Salsify	1 ounce	April, May	½ in.
Spinach	1 ounce	April, Aug.	½–1 in.
Squash, summer	½ ounce	June	1½ in.
Squash, winter	½ ounce	June	1½ in.
Tomato	25–50 plants	June	3–4 in.
Turnip	½ ounce	April, Aug.	¼–½ in.

PLANTING TABLE.—*Continued.*

Vegetable.	Planting Distance.			
	Distance between rows, horse cultivation.	Distance between rows, intensive cultivation or for amateur garden.	Distance between plants in rows.	Time to harvest.
Artichokes	3–4 ft.	3 ft.	3 ft.	Frost.
Asparagus, Seed	3–4 ft.	3 ft.	3–5 in.	
Asparagus, Plants	3 or 4 ft.	3 ft.	2–3 ft.	May 1st
Beans, bush	2½–3 ft.	1½–2 ft.	4–6 in.	July 1st
Beets*	2 or 2½ ft.	1–1½ ft.	3–4 in.	June 15th
Brussel Sprouts	2½–3 ft.	1½–2 ft.	2 ft.	Sept. 15th
Cabbage, early	2½–3 ft.	2–2½ ft.	18 in.–2 ft.	July 2nd
Cabbage, late	3 ft.	2½ ft.	2–2½ ft.	October
Carrot	2–2½ ft.	16–18 in.	2–3 in.	July 1st
Cauliflower	2½–3 ft.	2–2½ ft.	1½–2 ft.	Aug. 15th, frost
Celery	3–5 ft.	1½–3 ft.	6–8 in.	Aug. 15th, frost
Citron	6–8 ft.	6 ft.	4–6 ft.	Aug. 15th, frost
Corn, sweet	2½–3 ft.	2–2½ ft.	2–3 ft.	Aug. 1st
Cucumbers	6 ft.	4 ft.	1 ft.	Aug. 1st
Egg Plant	2½–3 ft.	2–2½ ft.	1½ ft.	August
Kale or Barecole	2½–3 ft.	1½–2 ft.	1–2 ft.	Frost
Kohl-rabi	2–2½ ft.	1½–2 ft.	6 in.	August 15th
Leeks	2–2½ ft.	1–1½ ft.	2–4 in.	Aug. 15th, frost
Lettuce	2 ft.	1–1½ ft.	4–6 in.	June 1, all season
Melon, musk	6 ft.	6 ft.	12 in.	Sept. 1st
Melon, water	7–9 ft.	4–6 ft.	4–6 ft.	Sept. 15th
Onion, seeds	2–2½ ft.	1–1½ ft.	8 plants to 1 ft.	Sept. 1st
Onion, sets	2–2½ ft.	1–1½ ft.	1 in.	June 1st
Parsley	2–2½ ft.	1–1½ ft.	2–4 in.	July 1st
Parsnip	2–2½ ft.	1½–2 ft.	3–4 in.	Aug. 15th, frost
Peas	2½–3 ft.	2 ft.	½ in.	July 1st
Pepper	2–2½ ft.	1½–2 ft.	15–18 in.	Sept. 1st
Potato, Irish	2½–3 ft.	2–2½ ft.	9–12 in.	July 15th
Pumpkin	6–8 ft.	6–8 ft.	6–8 ft.	Sept. 15th, frost
Radish	2–2½ ft.	6–12 in.	½–1 in.	May 15th, frost
Rhubarb, plants	3 ft.	2 ft.	2–3 ft.	May 1st
Salsify	2–2½ ft.	1½–2 ft.	2–4 in.	Sept. 1st
Spinach	2–2½ ft.	6–12 in.	½–1 in.	June 1st
Squash, summer	3–4 ft.	3–4 ft.	3 ft.	July 15th
Squash, winter	7–9 ft.	7–9 ft.	3–4 ft.	Aug. 15th, frost
Tomato	3–5 ft.	1½–2 ft.	3 ft.	July 15th, frost
Turnip	2–2½ ft.	1½–2 ft.	4–6 in.	Sept. 1st